WTCI-132-P

Engineering Quality
Assurance Division

TENANT CONSTRUCTION REVIEW MANUAL

March 1984

Revised March 1990

Engineering Department

THE PORT AUTHORITY OF NY & NJ

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SECTION 2 INTRODUCTION

This Manual is published to present the technical criteria to be considered by Tenants at Port Authority facilities in connection with construction work undertaken by a Tenant, which is in addition to other requirements under the agreement between the Port Authority and the Tenant. This Manual also covers the Port Authority Engineering Department scope-of-review of the design documents (plans, specifications, calculations and other documentation) submitted by Tenants in connection with proposed construction or alterations. It shall not be deemed to imply that there will not be additional reviews by other Port Authority Departments.

Reviews will not address the proposed aesthetic or functional aspects of the design.

Construction documents for Tenant alterations will be reviewed by the Engineering Department for compliance with applicable Codes and Port Authority Engineering Standards. In the absence of a specific code provision, this Manual sets forth the applicable standards to be followed by Tenants except as may otherwise be required of the Tenant. All design documents shall reflect the existing construction as well as the proposed work in order to determine compatibility with existing conditions at facilities.

In this regard a list of all documents and guidelines which the Facility has provided to the Tenant, and which affects the design, should become an integral part of the Tenant's contract document submission. If the subsequent review process will be aided by the inclusion of the construction documents itemized on this list, such documents should also be included in the submission.

The Tenant Construction Review Unit of the Engineering Department will review the Tenant Construction or Alteration Application submitted by the Tenant in accordance with the criteria included in this Manual. The responsibility for engineering design shall remain with the Tenant's Engineer or Architect preparing the design. The Tenant Construction Review Unit will not impose solutions to engineering problems but will comment on the design presented.

1. All proposed construction shall be submitted for review, in completed form, accompanied by a "Tenant Construction or Alteration Application," Form PA531, which shall be provided to the Tenant by the appropriate Port Authority line department.

   The line department shall specify to the Engineering Department, the technical disciplines to be reviewed for the submitted projects.

2. The design documents, such as drawings, reports, computations and specifications, required in connection with the proposed construction, shall be attached to and form a part of the Tenant Construction or Alteration Application, and shall reflect the existing construction as well as the proposed work, and be sealed and signed by the architect or engineer of record licensed to practice in the State in which the proposed construction is to be performed. The architect/engineer indicated on the Application shall be considered the A/E of record.

   Where the A/E of record submits documents prepared by other consultants, he is responsible for assuring that the documents from all the consultants are properly coordinated.

   Where other consultants have been acknowledged by the A/E of record, either in the Alteration Application or on the drawings, said consultants may seal and sign the documents they have prepared.

   Where the Tenant retains two or more independently functioning consultants, they each become an A/E of record for the scope of their work, for which each will be required to submit a separate Alteration Application, and each such consultant shall seal and sign the documents he submits.

   Responsibility for design or code compliance shall not be delegated to contractors.

3. Voluntarily installed systems, such as sprinklers, alarms, etc., *shall comply with the provisions of the Building Codes for such* systems.

4. Fire protection plans, as described in the New York City Building Code Section 27-228.1 (C26-124.1) et seq., shall be filed for review along with other design documents for construction projects in all the Port Authority facilities. After the approval of the project for construction, and before a certificate of occupancy is issued, one (1) copy of these plans shall be submitted to the manager of the facility where the project is located and two (2) copies shall be filed with the Quality Assurance Division of the Engineering Department.

5. In accordance with the policy of the Port Authority of New York and New Jersey, the Tenant shall comply with the provisions of all federal, state, municipal, local and departmental laws, ordinances, rules, regulations and orders that may affect the contract and all individuals involved therein. Where stricter requirements apply, i.e., those contained in the specifications or drawings, they shall be followed. The Tenant or his agents shall not apply for any variance, license, waiver or permit in the name of or on behalf of the Port Authority.

D. Special structural conditions, including foundations.

E. Special or unusual mechanical or electrical problems affecting environmental, energy or power requirements.

F. Deviations from Code provisions.

G. Existing structures shall be reviewed for existing Code violations.

III. PANY/NJ CRITERIA

Note: See the subsequent sections of this Manual for more specific criteria.

A. Sprinklers in conveyor spaces inaccessible to firefighting equipment. Ceilings with lay-in panels are considered to be inaccessible.

B. Adaptation of Code and NFPA standards to loading bridges, hangars, terminal buildings, etc.

C. Protection of airport buildings from potential fuel spillage fires.

D. Requirements for draperies, furniture, etc.

E. PVC pipes, ducts, conduits and insulation for wires shall not be used within buildings.

V. COORDINATION WITH FACILITIES

A. Electrical: New power requirements shall be indicated.

B. Water supply: Coordination of any demand for chilled water, high temperature water, domestic water, high pressure sprinkler supply water, and connections to the fire protection loop, shall be fully described.

C. Any work affecting the fuel lines shall be specified.

SECTION 5 ARCHITECTURAL

I. GENERAL

The scope of the architectural review shall comprise compliance with the applicable codes, standards, and design criteria listed below.

II. CODES AND REGULATIONS

A. New York City:

1. New York City Building Code and its Reference Standards.
2. New York City Fire Prevention Code and Directives.
3. New York City Local Laws.
4. Rules of the Board of Standards & Appeals (BS&A).
5. New York State Labor Laws.
6. New York State Multiple Dwelling Laws (Hotels).
7. New York State Energy Conservation Construction Code.
8. Directives and Memoranda of the Department of Buildings.

B. New Jersey:

1. New Jersey Uniform Construction Code, its bulletins and the sub-codes (BOCA, etc.), with their Supplements and Reference Standards.
2. Applicable Flood Controls.
3. New Jersey Uniform Fire Code.

C. The City of Yonkers:

1. Prior to 6/2/89: The Codes of the City of Yonkers.
2. After 6/2/89: The Uniform Fire Prevention and Building Code of New York State.

III. STANDARDS

The latest applicable National Fire Protection Association (NFPA) fire codes shall be used as reference standards, such as Number 409 for hangars, Number 416 for terminal buildings, Number 417 for loading bridges, and Number 75 for computer rooms, etc.

IV. PORT AUTHORITY DESIGN CRITERIA

A. General:

1. In unsprinklered areas, upholstered materials, furniture and draperies shall conform to the specifications governing flammability. See Attachments A1 to A4.

2. All baggage handling areas and conveyor spaces inaccessible to fire fighting equipment shall be provided with a sprinkler system. Ceilings with lay-in panels are considered to be inaccessible.

3. Conveyor belting shall be certified to be the best commercially available as to flame spread rating and smoke development characteristics.

4. Storage under canopies (such as at cargo buildings) shall be considered as storage occupancy, moderate hazard.

5. Baggage handling (as opposed to storage) spaces shall be classified as occupancy group B-2 in New York City, and S-2 in New Jersey.

6. For Cement Plaster Ceiling Design Standards, see Attachment S1.

B. Airports:

1. General:

a. The means of egress shall be designed for an occupant load consisting of the sum of the passengers (100% occupancy of aircraft), meeters and greeters, and permanent staff, based on maximum anticipated flight schedules (such as holidays or other seasonal peaks), and a two (2) hour delay of flights. This number shall not be less than 1.5C, where C is the capacity of all passenger vehicles that can be unloaded simultaneously (as indicated in the New York City Building Code Table 6-2). Consideration shall be given to locations of concentrated crowding, rather than assuming uniform distribution of occupants over the entire building.

b. In terminal buildings, concessions serving the public shall be considered as part of the public space. Storage space belonging to concessions shall be enclosed as required by Code. Also, adjacent concession areas shall be separated from each other as required by Code for different tenancies.

c. For aircraft loading walkways, and for protection of buildings from rampside fuel spill fires, see Section 13 of this Manual.

d. Protection and rating of building walls adjacent to aircraft fuel pipeline surge suppressors shall be in accordance with NFPA 30 (See NFPA 30-1987, Chapter 5).

2. Kennedy Airport, the International Arrivals Building:

a. The International Arrivals Building (IAB) is considered to conform to construction classification 1B, a nominal fire rating of three (3) hours.

b. On the third (3rd) floor of the IAB, an existing "exterior passageway" of a minimum predetermined width shall provide a means of egress from the floor.

3. LaGuardia Airport, the Central Terminal Building:

a. The main building is considered to conform to construction classification 1B.

b. The fingers are unprotected steel (construction classification 1E) separated from the main building, and are further subdivided into fire areas.

c. On the third (3rd) floor of the Terminal Building, a Safe Area, in compliance with Article 8 of the 1968 Code, constitutes part of the overall means of egress from the floor.

C. Port Authority Bus Terminal:

1. South Wing: The design of Tenant areas opening onto the Main Concourse shall conform with New York City Building Code Section C26-604.3(h)(3)d.3 for "Street Floor Lobbies."

2. North Wing: For the code analysis, see the PANY/NJ document titled "Port Authority Bus Terminal, Expansion, New York City Building Code and Life Safety Requirements," dated April 11, 1984.

V. DETAILS OF ARCHITECTURAL REVIEW

The following are representative of details reviewed:

A. Existing violations.

B. Occupancy (use) of spaces, construction classification (hourly rating of the structure), and their compatibility.

C. Requirements for sprinklers, standpipes, smoke detectors, and fire alarms.

D. Provisions for the handicapped.

E. Compartmentation of spaces (rated segregations, shafts, etc.).

F. Fire protection of building components and finishes (includes documentation verifying that all materials and equipment used are of an approved type).

G. Egress, establishing occupant load and exiting capacity.

H. Verification of strength and markings of all glass subject to human impact, and the requirement for markings as per BS&A Rules Number 501-68-SR.

I. Provision of plumbing fixtures (toilets, drinking fountains, etc.).

J. Application of NFPA (National Fire Protection Association) Codes to hangars, terminal buildings, loading bridges, cargo buildings, and computer rooms.

K. Protection of airport buildings from fires at rampside points of potential fuel spillage (fuel hydrants, fill and vent points, and catch basins). See Section 13 of this Manual.

L. The applicability of PANY/NJ Specifications Governing the Flammability of Upholstery and Plastic Furniture, Carpeting, and Drapery. See Attachments A1 through A4.

M. Code requirements for Tenant's consultant's inspection responsibilities. See Section 14 of this Manual.

N. Requirement of architect's or engineer's seal, signature, and address on dravings and design documents.

O. In conveyor systems, it is required that positive means be designed to insure the prevention of obstructions interfering with the fire shutters. In order to fulfill their purpose, these shutters shall be integrated with:

1. Smoke detectors, conveniently located for detection in order to actuate the motorized doors and the alarm system.

2. Leading edge or electric eye devices to permit the passage of an obstruction on the conveyor by retraction of the conveyor door.

3. Emergency power for the operation of the rated door(s), as well as for an adequate portion of the conveyors, to enable the passage of obstruction at the rated door(s).

4. Stoppage of the conveyors.

5. Operation of other smoke and heat detectors within the fire zone shall also actuate these doors.

P. Where spaces are provided with grilled openings for entrance and exiting, a safe means of egress shall be provided for the employees who may stay inside the space after the grill is closed, consisting of:

1. A door in compliance with the Code requirements.

2. Or an approved device that will open the grill from inside.

SECTION 6 STRUCTURAL

I. GENERAL

A. The scope of the structural review shall comprise compliance with the applicable Codes, standards, and design criteria listed below.

B. Computations shall be submitted with all structural plans.

II. CODES AND REGULATIONS

A. New York City:

1. New York City Building Code.

2. Rules and Regulations of the Department of Buildings, such as:

   a. Resistance to Progressive Collapse Under Extreme Local Loads.

   b. Design of Composite Construction with Metal Decks or Lightweight Concrete.

   c. Structural Designs Based on Electronic Computer Computations.

   d. Design and Installation of Curtain Wall Systems.

   e. Masonry Parapet Walls.

B. New Jersey:

New Jersey Uniform Construction Code (NJUCC).

C. City of Yonkers:

The Uniform Fire Prevention and Building Code of New York State.

III. STANDARDS

AASHTO American Association of State Highway and Transportation Officials.

AREA American Railway Engineering Association.

IV. PORT AUTHORITY DESIGN CRITERIA

A. All structures, including those in New York State, shall be designed for earthquake Zone 2 forces. BOCA provisions shall apply, unless more stringent local laws are adopted.

B. Roof Snow Load in New Jersey:

In calculating snow loads, BOCA "Ground Snow Load" shall be 25 psf.

C. Ceilings:

1. Cement plaster ceilings - see Attachment S1.

2. Lightweight ceilings in New Jersey - see Attachment S2.

3. Lightweight ceilings in WTC - see Attachment S3.

D. Vehicular Traffic (Airports):

1. Elevated roadways shall be designed for seismic forces according to the "Guide Specifications for the Seismic Design of Highway Bridges" by AASHTO, or the relevant State DOT standards for earthquakes, whichever is stricter.

2. The minimum loading for departure and arrival ramps servicing passenger terminals shall be HS 15-44. Use AASHTO design. All other ramps servicing cargo facilities or road overpasses: AASHTO design using HS20 minimum loading.

E. Highway Signs and Luminaries:

Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals; American Association of State Highway and Transportation Officials (AASHTO).

F. Loading Bridges (Airports):

1. Minimum Live Loads:	Floor (LL) - 40 psf or a concentrated load of 300 lbs. Roof (RLL) - as per local code.
2. Minimum Wind loading (WL):	12.5 psf lateral for the extended (operational) mode (combined windward and leeward pressure). 25 psf lateral for the retracted (stowed) mode (combined windward and leeward pressure).

3. Minimum Load Combinations:

   a. Extended: DL + LL + RLL
      DL + LL + 1/2RLL + WL
      DL + WL

   b. Retracted: DL + RLL
      DL + RLL + WL
      DL + WL

4. Minimum Stability Factors:

Overturning	1.5
Sliding	1.5
Uplift	1.5

5. Codes (except where stricter requirements are noted):

   a. New York City - New York City Building Code.

   b. New Jersey - The Construction Code (BOCA).

V. DETAILS OF STRUCTURAL REVIEW

The following are representative of details reviewed:

A. The design calculations shall include but not be limited to:

1. Design criteria and applicable Codes.
2. Reference Standards.
3. Materials.
4. Type of construction and foundations.
5. Design loads; including wind and other existing forces.
6. Machinery and equipment loads in excess of 1000 lbs. including an evaluation of any potential vibration.
7. Allowable soil bearing capacity.
8. Pile type and capacity.
9. Design analysis and drawings of all connections other than AISC standard framed or seated beam connections.
10. Analysis and sketches of expansion joints.
11. Design of bracing systems and rigid joints.
12. Wind drift and deflections.

13. Ponding.

14. Computer print-outs and users' manuals.

15. Investigation of superimposed loads from adjacent construction on structure and foundation.

16. Investigation of existing structural system and foundations under additional loads due to alterations.

17. Where it has been established that post-construction settlements of foundations are to be monitored, the monitoring program, the limits of such differential settlement that the structure can tolerate, and the necessary adjustments shall be submitted for review.

B. Drawings shall include but not be limited to the following information:

1. Design Code and Reference Standards.

2. Materials.

3. Design live loads, wind and other forces.

4. Machinery and equipment loads in excess of 1000 lbs. including footprints or support layout(s) plus technical details of vibration isolators.

5. Allowable soil bearing capacity.

6. Pile type, capacity and minimum tip elevation.

7. Column schedule showing accumulated design load at each level for dead and live loads.

8. Stress diagram(s) for trusses.

9. Datum and ground water elevations.

10. Typical moment connection details.

11. Details of non-standard connections.

12. Listing of materials subject to controlled inspection.

13. Construction sequence.

C. Specifications:

1. Shall clearly define the scope of work and materials required for the contract.

2. Shall include limitations, restrictions or conditions due to existing environs and/or requirements for the methods of construction or staging.

SECTION 7 GEOTECHNICAL

I. GENERAL

The scope of the geotechnical review shall be for compliance with the applicable Building Codes and will address the supporting soil characteristics and the choice of a foundation system compatible with the structure to be supported. In the absence of definitive Code requirements, P.A. standards and established practice will apply.

II. CODES AND REGULATIONS

A. New York City:

New York City Building Code.

B. New Jersey:

New Jersey Uniform Construction Code (NJUCC); BOCA.

C. City of Yonkers:

The Uniform Fire Prevention and Building Code of New York State.

III. STANDARDS

A. BOCA provisions for Zone 2 earthquake.

IV. PORT AUTHORITY DESIGN CRITERIA

A. The following P.A. Specifications are recommended:

1. Steel Pipe Piles.
2. Steel H Piles.
3. Timber Piles.
4. Pile Load Tests.
5. Dynamic Pile Testing.
6. Dense Graded Aggregate Base Course.
7. Excavation, Backfill, and Fill.
8. Slurry wall.

9. Dredging.

10. Rock Excavation.

11. Rock Dovels.

Note: Single acting steam or air hammer is recommended for pile driving in order to ensure the development of energy required by design. Where other types of hammers are used, Dynamic Pile Testing shall be performed to substantiate the minimum transferred energy required.

B. In Nev Jersey, the frost depth shall be considered to be three (3) feet.

C. All structures shall be designed for earthquake Zone 2. See Section 6, part IV of this Manual.

V. DETAILS OF GEOTECHNICAL REVIEW

The following are representative of details reviewed:

A. Required Reports:

1. Verification - Stabilized Overburden.

2. Bearing Capacity of Nominally Unsatisfactory Bearing Material.

3. Alternate or Similitude Method for Pile Load Verification.

4. Substantiation of Higher Allowable Pile Loads.

B. Calculations and reports to be revieved shall include but not be limited to the following:

1. Results of geotechnical site investigation, including test borings and laboratory tests; also, review of previous data obtained by the Port Authority or others.

2. Estimates of settlement resulting from the proposed construction (structures, pavements, utilities) at the construction and adjacent sites.

3. Where it has been established that post-construction settlements of foundations be monitored, the monitoring program shall be submitted for review. Also, see Section 6, item V.A.17 of this Manual.

4. Stability calculations of earth slopes and embankments, deep excavations, during and at the completion of construction.

5. Devatering and seepage analysis and control.

6. Effects of construction operations on adjacent properties.

7. Earth and rock anchors.

8. Sand drains, surcharging, deep compaction and other methods that may affect adjacent properties.

I. GENERAL

The scope of the civil review shall address the Tenant's documents, and shall concern itself with the documents' conformance with the applicable codes, standards, and other guidelines established in this section. The items to be reviewed will include proposed paving, sanitary sewer system and storm sewer system construction wherever they are placed on areas outside of the leasehold and/or wherever the proposed construction impacts upon the operations of the Port Authority or another Tenant, gas utilities, and the cold water domestic and fire protection distribution systems.

Those portions of the sanitary and storm sewers that service or will service more than a Tenant's leasehold (or premises) are hereinafter referred to as "for common service" sections of the respective utility.

II. CODES AND REGULATIONS

A. New York City:

1. Flood Control Regulations - New York City Building Code.

2. Applicable regulations of the New York City Environmental Protection Agency.

3. Barrier Free Design - New York City Building Code (ANSI A117.1).

B. New Jersey:

1. New Jersey Administrative Code - Title 7, Environmental Protection Laws.

2. Applicable Flood Control Regulations.

3. Barrier Free Design - New Jersey Uniform Construction Code.

4. Applicable regulations of the local municipal water supply and sanitary sewer governing agencies.

C. City of Yonkers:

The Uniform Fire Prevention and Building Code of New York State.

D. Federal:

1. Applicable regulations of the U.S. Environmental Protection Agency.

2. FAA - AC150/5300-12 Airport Design Standards.

3. FAA - AC150/5320-5B Airport Drainage.

4. FAA - AC150/5320-6C Airport Pavement Design and Evaluation.

III. STANDARDS AND PORT AUTHORITY DESIGN CRITERIA (See also Section 11)

A. General:

All site work outside the lease line shall conform to the latest details as shown in the appropriate Standard Drawings and Design Standard Sheets on file with the PANY/NJ Engineering Department.

B. Paving:

1. Paving of taxiways or aprons to be constructed within Public Aircraft Facility (PAF) areas, or in areas to be used by more than one Tenant, shall conform to the latest P.A. standards and thicknesses, and shall not be less than those shown on the P.A. Standard Drawings Number 062.001 and 062.002. - LCF

2. Paving within the airport's Tenant's lease line should be designed in accordance with the latest FAA Advisory Circular.

3. Erosion pavement or other alternate protective measures, such as a blast fence, shall be required wherever a blast from the aircraft may blow debris on adjacent property. Erosion pavement shall be designed in accordance with FAA Advisory Circular AC 150/5325-6.

4. See "Taxiway Paving" sketch, Attachment C1.

5. Roadway pavements outside of the lease line shall conform, as a minimum, to the P.A. Standard Drawings Number 062.001 and 062.003.

6. Sidewalks outside of the lease line shall conform to P.A. Standard Drawing Number 062.004, and Barrier Free Design.

C. Storm Sever:

1. Surface drainage of airport aprons shall comply with the National Fire Protection Association (NFPA) Standard 415.

2. At the aircraft fueling ramps, drainage inlets shall be equipped with vapor trap hoods. The hoods shall provide a minimum of 12" of water seal.

3. Common service storm sewers shall be properly supported as per P.A. Standards Number 041.001 and 043.001.

4. Common service storm sever appurtenances and pipes shall be designed to withstand the heaviest anticipated aircraft or vehicle load.

D. Sanitary Sewers:

1. Common service sanitary sever appurtenances and pipes shall be designed to withstand the heaviest anticipated aircraft or vehicle load.

2. In New York City, whenever a city sanitary or combined sever is within the P.A. facility boundary and affected in any way by a Tenant's proposed work, a note to the effect that "this work shall be coordinated with the appropriate City Department through a designated liaison person in the P.A.'s Chief Engineer's office" shall appear on the contract drawings.

3. In New York City, whenever a proposed Tenant's sanitary sever connection will be made to the City Sewer off P.A. property, the Tenant shall be required to apply directly to the appropriate City Department for approval and a note to that effect shall appear on the contract drawings.

E. Cold Water Distribution Systems:

1. The cold water distribution system pipes and appurtenances are interconnected to the facility-wide cold water distribution systems and are for common service.

2. All cold water distribution system pipes and appurtenances shall be designed to withstand the heaviest anticipated aircraft or vehicle load.

3. All cold water distribution system pipes shall have either a minimum bury of 4'-0", or be heat traced and insulated.

4. Pipe encasement(s) shall conform to the requirements indicated on Attachment C2.

5. Fire hydrants shall be spaced in accordance with the National Fire Protection Association Standards and Guides, and local municipality requirements, but in no case shall any part of a building's periphery be more than 300 feet from a hydrant.

6. Shut off valves shall be used at the point of connection wherever a proposed main is to be added to the existing distribution system.

7. All fire hydrants shall be connected to the supply main through a valved connection.

8. All curb and street valves shall be provided with a valve box meeting the requirements of the local municipal water authority.

9. All water distribution pipes and appurtenances shall be restrained against thrust forces.

F. Gas Utilities:

Gas service piping design and installation shall be performed by the utility corporation whose jurisdiction covers the area in which the construction takes place, and verification of this conformance shall be submitted.

IV. DETAILS OF CIVIL REVIEW

The following are representative of details reviewed:

1. Location and plot plan with lease lines, showing all the coordinates.

2. For purposes of future reference:

   a. All areas to be paved and pavement details shall be shown.

   b. All underground utility service lines (proposed and existing) shall be shown and clearly identified.

   c. Details for all proposed utility service lines and appurtenances shall be shown.

3. Computations showing the capability of existing utility service lines and appurtenances to support new loads, signed and sealed by the Professional Engineer licensed to practice in the State where the work is to be performed.

4. Dravings shall be signed and sealed by a Professional Engineer licensed to practice in the State where the work is to be performed.

5. Whenever an existing utility service line is to be interrupted by specified work, a note requiring advance notification of facility personnel shall appear on the drawings.

6. It is requested that the the PANY/NJ Engineering Department be informed of the quantities of water demand and sever load during the earliest stages of design.

SECTION 9 ELECTRICAL

I. GENERAL

The scope of the electrical review encompasses an examination of design drawings, specifications, and computations, in regard to their compliance with the Codes, Standards, and Port Authority Design Criteria relevant to the particular facility.

II. CODES AND REGULATIONS

A. New York City:

1. New York City Electrical Code.
2. National Electrical Code.
3. New York City Building Code.
4. New York State Energy Conservation Construction Code.

B. New Jersey:

1. New Jersey Uniform Construction Code.
2. National Electrical Code.
3. BOCA National Building Code.
4. BOCA National Energy Conservation Code.
5. Illuminating Engineering Society Standard EMS-1, Lighting Power Budget Determination Procedure.

C. City of Yonkers:

1. The Uniform Fire Prevention and Building Code of New York State.
2. National Electrical Code.

D. Airports: Federal Aviation Agency Advisory Circulars.

III. STANDARDS

1. NFPA 20, Centrifugal Fire Pumps.

2. NFPA 409, Aircraft Hangars.

3. Factory Mutual Loss Prevention Data Sheet Number 5-4/14-8, Transformers.

IV. PORT AUTHORITY DESIGN CRITERIA

A. General:

1. Electric Service:

a. Power shall be purchased from the P.A. for: New York Airports, the World Trade Center, and the Port Authority Bus Terminal.

b. High-Tension Power, New York Airports:

i. Shop drawings of switchgear shall be submitted for P.A. approval in advance of fabrication. Switchgear shall be inspected by the P.A. at the factory.

ii. The Tenant's drawings shall include a complete one-line diagram showing all primary connections, switching and interlocks; power source, routing and feeder designations; size and type of feeder and conduit; KVA rating; types and voltages of all transformers; and all load data in justification of the amount of power requested.

iii. Transformers shall be installed in pairs with two (2) line switches normally closed and the tie normally open.

iv. Cable cuts and detailed drawings of high-tension splices shall be submitted.

v. P.A. specifications for the high-tension installation shall be used.

c. Metering where Power is Purchased from the P.A.:

i. Submetering by the Tenant is prohibited.

ii. Where the service is 200 amperes or less, the Tenant shall furnish and install all metering wiring and the meter socket as directed by the P.A. Engineer. The meter socket shall be a "Delta" HQ7-IN-200A or approved equal, 480Y/277V or 208Y/120V, 4 wire, 7 jav type with by-pass and cover. A watthour demand meter shall be provided by the P.A.

iii. Where the service is in excess of 200 amperes, the Tenant shall furnish and install all metering wiring, meter pan and C.T. cabinet as directed by the P.A. Engineer. The meter pan shall be in accordance with Table VII, and the C.T. cabinet shall be in accordance with Table VIII, of Con Edison's "Requirements for Electric Service Installations." A bottom connected watthour demand meter will be furnished and installed by the P.A. Bus-bar type C.T.'s will be furnished by the P.A., and shall be installed by the Tenant. KW values of connected, peak and expected additional loads shall be submitted to enable the P.A. to determine the C.T. ratios to be used.

iv. In coordination with the facility, indicate where meters are needed.

d. Where power is purchased from a local utility company:

i. Submetering by the Tenant is prohibited.

ii. Utility company requirements for inspection shall be coordinated with the facility.

2. Exploded-view dravings of electrical manholes in which the Tenant performs any work shall be submitted for review.

3. For fire detection and alarm requirements see Section 12 of this Manual.

4. For loading bridge requirements see Section 13 of this Manual.

5. For fire shutters in conveyor systems see Section 5 of this Manual.

6. PVC conduits and vire insulation shall not be used above ground within occupied buildings.

B. World Trade Center:

1. Conductors and Conduits:

   a. Minimum wire size for power shall be #12 AWG, copper.

   b. Minimum conduit size shall be 3/4-inch.

   c. Maximum EMT size shall be two (2) inches.

2. Afterset Fittings; Underfloor Cell Wiring:

   a. Each new or existing afterset fitting shall require two Palusol firestop packets, one on each side of the afterset baffle.

   b. Floor outlets to be removed or abandoned shall have all wires removed back to the panel or header duct and the afterset fitting removed. The underfloor cell shall be capped with a metal slug and the hole filled flush with concrete cement.

3. Grounding; Ground-Fault Protection:

   a. Wherever a grounding conductor is required (including feeders to motor loads greater than 1/8-horsepower), a separate ground wire shall be installed.

   b. On raised floors, a #6 grounding wire shall be connected to every fourth pedestal of the floor system, and to the nearest building steel by means of a thermal type welded connection.

   c. Ground-fault protection shall be provided for all receptacles and equipment located near running water, such as electric water coolers.

4. Exit signs, exit lights, and fire alarm control panels and devices shall be connected to a source of emergency power. Note that a connection to the street side of the main panel is not possible in the World Trade Center. Emergency power may be taken from storage battery packs or connected to the building emergency power riser, if available.

5. Energy Conservation: For the allowable connected load in watts per square foot, see published World Trade Center guidelines.

C. Port Authority Bus Terminal: For electrical work also see Attachments M1, M2 and M3.

V. DETAILS OF ELECTRICAL REVIEW

The following are representative of details reviewed:

A. The review shall extend to existing code violations in areas affected by the work.

B. The power distribution system (feeders, switchgear, transformers, panels and overcurrent protective devices), including coordination of plans regarding connections and available capacities with P.A. utilities. A one-line diagram giving source identification, conductor types and sizes, connected and demand loads, basis of source capacity, voltage drop, and adequacy of overcurrent protection shall be presented. Characteristics of special loads, e.g. large motor loads, shall be detailed.

C. Obstruction, envelopment or elimination of electrical ducts, vaults, manholes, and handholes, by new construction.

D. All materials and apparatus shall have been tested and approved for the proposed use by the agency or testing laboratory recognized in the relevant jurisdiction. See Section 14 of this Manual.

E. Coordination with other trades such as:

   a. Architectural: Place of assembly lighting.

   b. Structural: Suspension of lighting fixtures.

   c. Mechanical: Ventilation and cooling of electric rooms.

F. Wiring methods (conductors and raceways).

G. Grounding, including system grounding of derived systems such as transformers and generators.

H. Communications wiring with regard to radiation, electromagnetic interference, electrical safety and fire hazards.

I. Signal wiring and emergency power for fire alarm and detection systems.

J. Emergency power for lighting, exit lights and signs and opening protectives.

K. Computer room disconnecting means for electronic and HVAC equipment.

L. Code limitations on plastic light diffusers.

2. The Reference Standards of the above, such as those for Elevators, Conveyors, ASHRAE, SMACNA, etc.

3. New York City Fire Prevention Code.

4. New York State Energy Conservation Construction Code.

5. New York City Air Pollution Regulations.

6. Rules of the Board of Standards & Appeals (BS&A) of New York City.

7. N.Y.C. and National Electrical Codes.

B. New Jersey:

1. The New Jersey Uniform Construction Code (NJUCC), its bulletins and subcodes (BOCA Building, Mechanical, Fire Prevention, etc.) with their Supplements and Reference Standards.

2. National Standard Plumbing Code as amended by NJUCC.

3. BOCA Basic Energy Conservation Code as amended by NJUCC.

4. Illuminating Engineers Society Standard EMS-1.

5. National Electrical Code.

6. Rules, New Jersey Bureau of Air Pollution Control (Certification).

7. NJAC - Title 7 - Environmental Protection Laws.

C. City of Yonkers:

1. Prior to 6/2/89: The Codes of the City of Yonkers.

2. After 6/2/89: The Uniform Fire Prevention and Building Code of New York State.

III. STANDARDS

A. ASME: Boiler and Pressure Vessel Code.

B. ANSI: Pressure Piping Codes.

B-31.1 Power Piping.

B-31.3 Petroleum and Chemical Plant Piping.

B-31.9 Building Services Piping.

C. API (American Petroleum Institute):

a. 5L Steel Line Pipe.

b. 600 Series For Pumps, Valves, Etc.

c. 1104 Welding.

D. National Fire Protection Association (NFPA) standards:

1. NFPA 30, Flammable and Combustible Liquids Code.

2. NFPA 407, Aircraft Fuel Servicing (Fueling systems).

3. NFPA 416, Airport Terminal Buildings.

4. NFPA 417, Aircraft Loading Walkways.

E. CGA (Compressed Gas Association): Compressed Gas Handbook.

IV. PORT AUTHORITY DESIGN CRITERIA

A. Airports:

1. Systems connected to Central Heating and Refrigeration Systems shall comply with P.A. "Outline Specifications Requirements for Tenant Premises" including underground piping, conduits, and meters. Appurtenances shall be selected for maintenance compatibility with existing P.A. equipment.

2. Aircraft Fueling Service:

a. Work affecting the airport fuel distribution system shall be coordinated with the existing airport system for compatibility, surge pressure safety and system design check. Depending on the nature of the modification, surge pressure calculation may be required.

b. All automatic control valves shall be performance tested in compliance with the initial contract requirements of the P.A. Engineering Department, for the airport fuel systems.

c. Valving at fuel storage tank connections and at truck loading racks or hydrant valves shall be constructed with supplemental safety stop valves. These safety stop valves shall be closed by fusible link action upon exposure to fire, and shall conform to UL or API Fire Tested Valve Safety Standards.

d. For the protection of building walls around pressure surge suppressors see Section 5.IV.B.1.C of this Manual.

e. For the protection of the ramp drainage inlets see Section 8.III.C. of this Manual.

B. Bus Terminal: For the criteria controlling the HVAC Design, see Attachments M1 and M2.

C. For the World Trade Center, see the published W.T.C. guidelines for HVAC and fire safety systems.

V. DETAILS OF MECHANICAL REVIEW

The following are representative of details reviewed:

A. The review shall extend to existing code violations.

B. In revieving a proposed project, particular attention shall be given to:

1. General system design.

2. Coordination of all new work with existing conditions.

3. Review of materials, operating and safety controls, equipment approval (BS&A, MEA, etc.).

4. Requirements for system and equipment testing and inspection.

C. Work affecting the Aviation Fuel Servicing systems, and Central Heating and Refrigerating Systems, including additional load requirements, piping and metering, shall be coordinated with the Chief Mechanical Engineer.

D. Special attention shall be directed to the following items:

1. A complete schedule of symbols and abbreviations used on the drawings shall be provided.

2. HVAC:

a. Shaft requirements for air ducts.

b. Fire dampers at ducts through rated partitions and floors.

c. Installation details for fire dampers to stay in place if a duct is disrupted. (See SMACNA Fire Damper Guide). For World Trade Center see W.T.C. Standard Details. Access doors shall be accessible.

d. Smoke detectors and smoke/fire dampers at ducts entering "Safe Areas," exit passageways and lobbies.

e. Fire detector and smoke detector requirements for fan systems to shut fans and smoke dampers automatically and transmit signal.

f. Fire resistive insulation materials.

g. Air filters in ventilating systems (Class 1 or 2 with required fire protection systems).

h. Ventilation Index Schedule.

i. Smoke control systems.

3. Commercial type cooking/equipment: Grease ducts, extractors, dampers, insulation, fixed pipe fire extinguishing systems in hoods and ducts.

4. Noise and vibration control.

5. Energy Conservation: Building envelope analysis, design criteria, and thermal performance of component systems.

6. Bulk storage of liquids and gases: Tanks, supports, anchorage, clearances, electrical grounding, Fire Department regulations if stored materials are flammable, and leak detection.

7. Battery Charging Spaces:

a. Spaces dedicated to such use shall be classified as D-2 and F-2 occupancies in the New York City Building Code and BOCA, respectively.

b. The components of the charging system and their compatibility shall be approved in New York City by an agency such as the Board of Standards and Appeals (BS&A), the MEA, or the Advisory Board of the Bureau of Electrical Control (Department of Buildings); in New Jersey see Appendix A of the BOCA codes for acceptable agencies.

c. An adequate, continuous ventilation (exhaust) system shall be designed to prevent the accumulation of an explosive mixture of gases in the battery room under the worst conditions of battery and/or charger failure.

d. Also, see the National Electrical Code Section 480-8 and New York City Electrical Code Section B30-143.0.

SECTION 11 PLUMBING

I. GENERAL

The scope of the plumbing review shall consider, in general, the installation of and alteration to the following systems, in accordance with the codes and standards listed below:

A. Water supply and distribution.

B. Sanitary and storm drainage and disposal.

C. Industrial wastes.

D. Sprinklers.

E. Fire standpipes.

F. Gas piping.

G. Gasoline storage and piping.

II. CODES AND REGULATIONS

A. New York City:

1. New York City Building Code and its Reference Standards.

2. New York City Fire Prevention Code.

3. Rules of the Board of Standards & Appeals (BS&A).

4. New York State Energy Conservation Construction Code.

B. New Jersey:

1. The New Jersey Uniform Construction Code (NJUCC).

2. The National Standard Plumbing Code as amended by NJUCC.

3. BOCA National Building Code.

4. BOCA National Mechanical Code, as amended by NJUCC, where applicable (gas piping, etc.).

5. BOCA National Fire Prevention Code.

6. BOCA Basic Energy Conservation Code as amended by NJUCC.

7. The Supplements and Reference Standards of the Codes.

C. City of Yonkers:

1. Prior to 6/2/89: The Codes of the City of Yonkers.

2. After 6/2/89: The Uniform Fire Prevention and Building Code of the New York State.

III. STANDARDS (See also Section 8 of this Manual)

A. See Section 12, of this Manual.

B. National Sanitation Foundation approval for Kitchen equipment.

IV. PORT AUTHORITY DESIGN CRITERIA

A. General:

1. PVC piping shall not be used in above ground and exposed locations. Also, it shall not be used unless specifically permitted by the applicable Codes.

2. Fire standpipe hose shall be approved 100%-synthetic single jacket fire hose.

3. Clamps for no-hub piping shall be those manufactured by Clamp-All Corp.

4. All hubless pipes shall be anchored at each side of hub at five (5) foot intervals.

5. In demolition work, unused piping shall not be abandoned "in place." Piping shall be removed back to source or point of discharge, and the resulting openings plugged. Such work shall be shown on the drawings.

B. Airports:

Oil separator effluents shall be discharged into the sanitary sewer system.

C. World Trade Center:

Care shall be taken to place all horizontal standpipe and sprinkler piping that are parallel to the exterior walls, at least 15 feet from any exterior wall. If this is not possible, the piping shall be insulated.

V. DETAILS OF PLUMBING REVIEW

The following are representative of details reviewed:

A. General:

1. Dravings shall show a complete layout and riser diagrams.

2. An adequate extent of existing conditions and systems shall be shown to enable the review of alterations.

3. Specifications for materials, equipment, fixtures, insulation, installation procedures, etc., shall be submitted.

4. The review shall extend to existing code violations in areas affected by the work.

5. Areas of work shall be clearly identified with column numbers and occupancy identification.

B. The following is a partial list of items to be shown in the design documents (dravings, specifications, etc.):

1. Domestic Cold & Hot Water

Water service size; connection.
Gooseneck at street main.
Curb box and valve.
Pressure reduction valve.
Approved meter; hook-up and setting.
Water conserving devices.
Fixture roughing, trim, flow controls.
Expansion joints; accessibility.
Hot water heater hook-up; PRV & TRV.
Hot water circulation.
Plugged outlets; accessibility.
Backflow protection: airgaps, vacuum breakers, backflow preventers; accessibility.
U.S. Public Health Service Requirements.
Triturator room water requirements.
Plastic materials.
Piping materials: pipe, joints, lining, etc.
Insulation, fire rated; Energy Code compliance.
Testing.
Hose Bibbs; flushing hydrants.
Facilities for the handicapped.

2. Fire Standpipe

Size of water service.
Separate or combined system where permitted.

5. Storm Drainage

Building sewer size; directional flow connection to sewer.
Building drain size, slope, Code roof areas.
Leader size; Code roof areas.
Cleanouts; uncovered.
Expansion joints; accessibility.
Test requirements.

6. Oil Separator

Overall separator size, capacity.
F.A. inlet.
Relief vent and height.
One full size stack.
Overflow line, waste oil tank, vents.
Cleanouts; accessibility.

7. Gasoline and Motor Diesel Oil

Licensed Installer.
Size, location, capacity, construction of tanks.
Burial depth; earth cover; concrete cover.
Distance from basements, pits.
Corrosion protection.
Size, height of vents.
Tank encasement.
Fill box location, identification.
Pipe, fittings, joints.
Piping arrangement for suction connection.
Double swing joint connections.
Tank supports, foundations, anchorage.
Sewer protection; oil separator.
Testing.
Abandoning of tanks.

SECTION 12 FIRE PROTECTION

I. GENERAL

The scope of the review shall address the design of various fire detection, alarm and suppression systems.

Fire Protection is an integral part of several disciplines contained in all building, mechanical, electrical and fire protection codes.

II. CODES AND REGULATIONS

See the Architectural, Electrical, Mechanical and Plumbing Sections of this Manual for the applicable codes.

III. STANDARDS

The National Fire Protection Association (NFPA) Standards will be used in areas not covered by codes.

IV. PORT AUTHORITY DESIGN CRITERIA

A. General:

Concealed conveyor spaces inaccessible to firefighting equipment shall be provided with a sprinkler system. Spaces over all types of ceilings are considered inaccessible.

B. Fire Alarms:

1. Municipal fire alarm boxes shall be furnished and installed in conformance with the regulations of the Fire Department of the municipality in which the work will occur. These regulations shall control the type of devices to be used.

   See Attachment F1 for the procedure in Nev York City.

2. Proprietary and central station alarm systems in the P.A. facilities, where provided, shall be compatible with the existing systems.

3. All fire alarm station signals shall be transmitted to a central station via leased telephone lines (Police Emergency Garage or other designated location).

4. Manual fire alarm activation, sprinkler head activation, and smoke detector activation, shall sound the coded pre-signal gongs at facility-designated locations and send a coded signal to the central station. Code indicates location.

5. Criteria For Interior Fire Alarm Systems:

   a. At least one fire alarm (F.A.) station shall be installed per 10,000 square feet. Additional stations shall be required to limit the travel distance to 150'.

   b. One F.A. station shall be installed in each story at all natural paths of egress to the street.

   c. Stations shall be readily accessible and unobstructed. In general, F.A. stations shall be located at stairwells, near elevators, and at points of egress from the building.

   d. Sounding Devices:

      i. Shall be of sufficient number to be clearly audible to all occupants.

      ii. Shall be 10 inch single stroke gong on interior columns.

6. World Trade Center:

   a. Smoke detector signal wiring shall be #14 AWG minimum, Teflon insulated and jacketed, in conduit. Four #12 AWG wires shall connect to the two (2) normally-closed dry contacts (one supervisory, one alarm), and to the fire alarm multiplex system junction box in the appropriate electric closet. All system components shall be compatible with the World Trade Center building system.

   b. Sprinkler system tamper and waterflow switches shall be installed in conjunction with sprinkler water supply control valves and connected to the fire alarm multiplex system junction box.

7. P.A. Bus Terminal:

   a. See Attachments M1 and M2 for smoke and fire detection requirements.

b. Smoke detector activation shall sound the coded pre-signal gongs at facility-designated locations, send a signal to the Suburban Bus Level alarm console and Police Desk remote printout, and send a coded signal to the central station. Code indicates system activation but not zone. The zone is determined at the Suburban Bus Level alarm console or Police Desk.

8. Aircraft Loading Bridges: An interior manual fire alarm station and gong shall be located in the Terminal Building at the point of connection between the building and the bridge.

V. DETAILS OF FIRE PROTECTION REVIEW

The following are representative of details revieved:

1. Sprinkler and other systems using dry chemicals, foams, halogenated and other extinguishing agents, shall be submitted on drawings and signed and sealed by the Architect or Engineer of record, or if prepared by a specialized consultant, signed and sealed by such licensed consultant. Said consultants must be licensed to practice in the State in which the work will occur.

2. Sprinkler plans shall indicate or list the appropriate information and data specified in NFPA Standard 13 regarding available water sources, supply pressure, number and type of sprinklers, fire department connections, hazard classification, alarm devices and supervisory connections. Hydraulic computations shall be submitted when used.

3. A complete Fire Alarm riser diagram shoving locations of all stations, gongs, control panels and wiring, shall be shown.

SECTION 13 PROTECTION FROM AIRPORT RAMPSIDE FUEL SPILL FIRE

I. GENERAL

The following are minimum guidelines for the design of protective measures to reduce the hazard of a rampside fuel fire.

II. CODES AND REGULATIONS

Building codes, where applicable, shall serve as minimum design criteria.

III. STANDARDS

The National Fire Protection Association (NFPA) codes will be conformed to, where applicable. The following are representative NFPA standards to be used in conjunction with P.A. criteria (see also paragraph IV below):

A. Terminal Buildings, Satellites, Fingers, etc.:

1. NFPA 407, Aircraft Fuel Servicing, Sections 2-11.2 and 5-12.3, respectively limit the proximity of vent and fill points to air intake points on the building, and the proximity to the building of fueling cabinets and pits.

2. NFPA 415, Aircraft Fueling Ramp Drainage, Section 2, limits proximity of drainage points to structures, and establishes ramp gradients.

3. NFPA 416, Airport Terminal Buildings:

   a. Section 2-1.4 requires special provisions for below-grade areas to be protected from fuel and vapor penetration.

   b. Sections 2-2.2 and 2-2.3 define distance and protection of heating and ventilation openings on the building, and openings to certain mechanical rooms, from points of potential fuel or vapor release.

   c. Section 2-4.2 requires that exit doors discharging onto ramps be marked "EMERGENCY EXIT ONLY."

   d. Section 2-7.1 requires protection of window glass when potential fuel spill points are within 100 feet (also, see paragraph IV. A.1. below).

B. Articulating Loading Walkways:

NFPA 417 Aircraft Loading Walkways.

IV. PORT AUTHORITY DESIGN CRITERIA (See Attachment RFS-1)

A. Terminal Buildings, Satellites, Fingers:

A fire geometry with a 25 foot radius (as observed from NAFEC tests) shall be considered around points of potential fuel spillage (ppfs) such as fueling hydrants, catch basins, fuel tank fill connections, and tank vent openings. The exterior walls of the building shall be protected as follows:

1. There will be no ppfs within 50 feet of the building.

2. When the ppfs is 50 to 85 feet, the building shall be protected as required by the local Building Code, based on the "exterior (fire) separation."

3. Large areas of window glass, covering more than 50% of a wall, which has a distance of less than 100 feet from a ppfs, shall be protected by means of an automatic system of water curtain or fire shutters activated by an appropriate fire detection system.

   Note: In determining the above percentges, only that portion of the wall <u>not</u> backed by the building's structural components should be included. Also, the distance from the ppfs shall be measured to the center of the wall - in its plan view.

4. Exit doors or exit stairs opening onto the apron within 85 feet of potential points of fuel spillage must be protected by a full height radiation barrier.

B. Articulating Loading Walkways:

1. The design shall provide a safe exit route from the aircraft for a period of at least five (5) minutes under severe fire exposure conditions equivalent to a free-burning jet fuel spill fire in compliance with NFPA 417, Aircraft Loading Walkways. The engineer-of-record shall certify compliance in writing and submit the test reports and computations as defined in NFPA 417 to demonstrate said compliance.

2. It is recommended that loading bridges be designed to prevent sudden failure (collapse, explosion or development of excessive smoke and gases) during the ten (10) minute test.

3. Walkways to be used as exits shall comply with the following:

   a. A maximum travel length of 150 feet. Portions exceeding 150 feet shall be designed as part of the terminal building.

   b. A minimum width of 44 inches or the width of the aircraft door being served, whichever is larger.

   c. A maximum slope of 1:10.

   d. Class A interior finish and floor coverings.

   e. Non-slip floor covering.

   f. Emergency lighting.

   g. Light diffusers of plastic material shall be of an approved type for exits, or wired glass shall be used.

4. Compliance shall include:

   a. Structural integrity of the walkway under the fire conditions. For structural criteria see Section 6, paragraph IV of this Manual.

   b. Structural columns, as principal structural parts, shall also be designed with the capability to endure the fire test.

   c. Interior atmosphere (toxic products of decomposition and/or dense smoke resulting from fire), and the maximum temperature of 248^{o}F.

   d. Component durability.

   e. Integrity of closure curtain with respect to smoke penetration through cracks and openings shall be established.

5. Windows shall not be allowed, except the minimum required by the operator, which shall be protected by wired glass or an automatic fire shutter.

6. The door opening onto the walkway shall have an electrical interlock to prevent opening until the walkway is engaged with the plane.

7. The aircraft loading walkway shall not be located over any drainage outlets. NFPA 415, Section 2-1.4.

8. The electrical installation shall comply with the (stricter) applicable requirements of the National Electrical Code and the local Electrical Code, particularly with the Hazard Requirements; i.e., presence of flammable vapors from aircraft fueling, venting and storage points.

9. The hydraulic and electrical system for the bridge shall be demonstrated to be fail-safe.

SECTION 14 MATERIALS, OPERATIONS, AND EQUIPMENT APPROVAL AND INSPECTION

I. GENERAL

The purpose of this section is to outline:

A. The requirements for acceptance (approval) of materials, assemblies, forms, methods of construction, and the intended use of equipment.

B. The requirements for inspection of materials and assemblies and construction.

II. CODES AND REGULATIONS

A. New York City:

1. New York City Building Code and its Reference Standards.
2. New York City Fire Prevention Code and Directives.
3. New York City Electrical Code.
4. New York City Local Laws.
5. Rules of the Board of Standards & Appeals (BS&A).
6. New York State Labor Laws.
7. New York State Multiple Dwelling Laws (Hotels).
8. New York State Energy Conservation Construction Code.
9. Directives and Memoranda of the Department of Buildings.

B. New Jersey:

1. New Jersey Uniform Construction Code, its bulletins and the sub-codes (BOCA, etc.) with their Supplements and Reference Standards.
2. Applicable Flood Controls.
3. New Jersey Uniform Fire Code.

C. The City of Yonkers:

The Uniform Fire Prevention and Building Code of New York State.

III. NEW YORK CITY

A. Approval/Acceptance of Materials, Equipment, etc.:

No material, assemblies, forms, method of construction, equipment, machinery and devices will be acceptable for the intended use unless:

1. Accepted by the Code test method by the Materials and Equipment Acceptance (MEA) division of the Office of the Commissioner of the Buildings Department of New York City.

2. Or approved by the New York City Board of Standards and Appeals (BS&A).

Resolutions of MEA or BS&A shall be submitted for review along with other review documents. Manufacturers' or distributors' letters shall not be acceptable.

The above requirements are abstracted from New York City Building Code Sections C26-106.1, 106.2, 107.1 and 107.2.

B. Inspection:

Controlled Inspection (Code Sections C26-106.3 and 107.3):

1. All materials, equipment, and construction, designated by the Code for "controlled inspection" shall be inspected and/or tested to verify compliance with the Code.

2. Controlled inspection shall be made and witnessed by or under the direct supervision of a registered architect (RA) or professional engineer (PE), retained by the tenant and acceptable to the architect or engineer responsible for the plans. The inspecting RA or PE shall be independent of the contractor.

3. All items subject to controlled inspection shall be listed on the title sheet of the plans, or the sheet immediately following.

The following list contains items subject to controlled inspections, as well as the items' relevant Code sections, where applicable:

Borings or test pits C26-1112.2

Piles..... C26-1112.3

Soil .....

Subgrade for foundation C26-1112.5

Controlled fill	
Underpinning	C26-1112.6
Concrete	Code Tables 10-1, and 10-2
Prestressed concrete	
Precast Concrete	
Formwork	C26-1904.3(b)
Steel	
i. Welding	Code Table 10-2
ii. H.S. bolts	Code Table 10-2
iii. Cable fittings	Code Table 10-2
Aluminum, welding	Code Table 10-2
Laminated wood	Code Table 10-2
Firestops	C26-504.7(g)
Spray-on fireproofing	C26-502.2(f)
Heating systems	C26-1401.1(a); 1401.2(b)
Ventilation systems	C26-1301.2; 1301.3
Refrigeration systems	C26-1301.4
High pressure systems	
Chimney smoke vent	C26-1501.1(e); 1504.1(b)
Exterior walls	C26-105.1
Structural integrity during construction operations	Department of Buildings, Rules.

IV. NEW JERSEY

A. Approval/Acceptance of Materials, Equipment, etc.:

Acceptance of materials, assemblies, equipment, forms, methods of construction, etc., shall be based on authenticated reports from approved agencies indicating compliance with accepted engineering practice. See BOCA Building Code Section 1300, BOCA Mechanical Code Section 4.02.0, and the Appendix A of these Codes for approved agencies and testing standards.

Note: The P.A. Engineering Department has accepted approvals from the New York City Board of Standards & Appeals (BS&A) and Material and Equipment Acceptance (MEA). See III.A above.

B. Inspection:

Construction Control - as per NJUCC 5:23-2.21(c):

1. The tenant shall assign a "responsible person in charge of the work" (RPIC), who shall be responsible for:

   a. Reviev and approval of all documents pertaining to the construction phase.

   b. Verification of all controlled materials.

   c. Special inspection of critical construction components (see list in paragraph 2 below).

   d. Necessary services to determine that the work is proceeding according to the approved documents.

   e. At the completion of work, the RPIC shall submit a report to the P.A. attesting to the satisfactory completion of the project, including a list of deviations from the approved documents.

2. The following is the list referred to in the requirement for "special inspection of critical construction components," stated in item B.1(c) above. Effort has been made to make this list as inclusive as possible based on the current codes adopted by the NJUCC. Other construction aspects subject to "special inspection" as required by these codes, that have been omitted by this list must also comply. These inspections shall be performed by a licensed engineer or a registered architect, licensed to practice in the State in which the work will occur, and the reports submitted to the P.A.

a. Foundations:

   i. Boring operations.....BOCA, Section 1203.1

   ii. Subgrade for foundations.

   iii. Controlled fill.

   iv. Piling (installation, testing, cut-off and tip elevations).....Section 1213.12

   v. Support of adjacent properties.

   vi. Underpinning.

   vii. Foundations and walls up to grade prior to backfilling.

b. Structure:

   i. High strength bolts - see BOCA Building Code Table 1308.3.2.

   ii. Welds.

   iii. Concreting operations - see BOCA Building Code Table 1308.4.4.

c. Plumbing:

   i. Underground services.

   ii. Rough piping.

   iii. Water services.

   iv. Sewer.

   v. Septic service.

   vi. Storm drains.

d. Electrical:

   i. Rough wiring.

   ii. Panels and service installation.

   iii. Insulation installation.

e. Mechanical equipment systems.

f. Heat producing systems.

3. The contractor shall, at the completion of the construction, certify that the construction has been executed in substantial accord with the approved documents, with all pertinent deviations specifically noted.

SECTION 15 ENVIRONMENTAL

I. GENERAL

The scope of environmental review shall address asbestos management, soil and water sampling and analyses, soil and waste excavation - use or disposal, and underground storage tank installation, testing, repair or removal. Designs and specifications will be revieved for compliance with applicable codes, regulations and standards. Reports on the results of environmental investigations and analytical results shall be submitted to the Port Authority.

II. CODES AND REGULATIONS

A. New York City and New Jersey; the following federal laws and the corresponding state laws and regulations are applicable:

1. Clean Air Act.
2. Clean Water Act.
3. Federal Insecticide, Fungicide and Rodenticide Act.
4. Noise Control Act.
5. Occupational Safety and Health Act.
6. Resource Conservation and Recovery Act.
7. Toxic Substances Control Act.

B. New York City:

1. Administrative Code of the City of New York.
2. Asbestos Control Program.
3. Department of Sanitation Codes.

C. New Jersey:

1. New Jersey Administrative Code.
2. Environmental Cleanup Responsibility Act.

D. City of Yonkers:

The Uniform Fire Prevention and Buildng Code of Nev York State.

III. STANDARDS

1. Port Authority Standard Specifications for asbestos removal.

2. National Fire Protection Association.

3. American Petroleum Institute guidelines.

IV. PORT AUTHORITY REVIEW

The following are representative of the details of review:

A. Asbestos Management:

1. Work procedures and staging.

2. Dimensions, plans and isolation barriers.

3. Decontamination system.

4. Ventilation and air control systems.

B. Soil/Water sampling, analyses, use, disposal:

1. Location and depth of samples.

2. Test parameters.

3. Soil/water disposal methods.

C. Underground Storage Tanks:

1. Design of nev tank installation.

2. Results of tank tests and monitoring.

3. Design of tank removal or abandonment.

4. Design of tank repair.

ATTACHMENT A1 SPECIFICATIONS GOVERNING THE FLAMMABILITY OF CARPETS

A. These specifications apply to carpets and carpet assemblies when used only as a floor covering. Carpeting assemblies include the carpet, its underlay, and adhesives which when tested as a composite shall be representative of the proposed installation.

B. Carpet and carpeting assemblies shall not be installed in stairways designed for exiting to meet building code requirements.

C. All carpets and underlayments shall pass the Methanine Pill Test, Department of Commerce Standard FF 1-70.

D. Carpet and carpeting assemblies shall be tested by the Standard Test Method for Critical Radiant Flux of Floor Covering Systems using a Radiant Heat Energy Source, ASTM E-648-78. The time frame for this procedure may be limited to a 15 minute exposure.

1. Carpet and carpeting assemblies representative of the actual installation on floors of corridors, exitways (except exit stairways), and exit passageways shall have a minimum critical radiant flux of 0.5 watts per square centimeter (W/sc).

2. Carpet and carpeting assemblies representative of the actual installation on floors of general areas shall have a minimum critical radiant flux of 0.4 W/sc.

E. Carpet and carpeting assemblies shall be tested using the Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials, ASTM E662-79.

The smoke developed ratings in either the flaming or non-flaming mode shall not exceed 300 within the first four (4) minutes of the test.

F. The manufacturer of the carpet and carpeting assemblies is required to submit a certification, by a recognized independent laboratory, showing the complete test data results, prior to final acceptance.

The certification shall state that the material is treated for fire resistance and shall indicate the service life of the treatment or that the material is inherently fire resistant by virtue of its construction, chemical properties and/or composition. Materials which are not inherently fire resistant may be used only when the certified fire resistant service life exceeds that of the planned service life of the carpet and carpeting assemblies with consideration being given to cleaning, traffic, and other conditions of use which may affect the treatment.

ATTACHMENT A2

SPECIFICATIONS GOVERNING THE FLAMMABILITY OF DRAPERY AND CURTAIN MATERIALS

A. All drapery and curtain materials, including linings, shall be subject to the vertical flame tests as required by Federal Aviation Administration (FAA) Regulation 25.853(b) and Appendix F dated May 1, 1972.

The test method requires that the flame shall be applied for 12 seconds and then removed, that the average char length shall not exceed eight (8) inches, that the average flame time after removal of the flame source shall not exceed 15 seconds, and that drippings from the test specimen shall not continue to flame for more than five (5) seconds after falling.

B. The manufacturer of the finished item shall submit written certification for each component fabric of the completed items as follows:

1. If the material contains 100% fibers that are inherently flame resistant by virtue of the physical properties of the untreated fiber, a written certification by a recognized independent testing laboratory, attesting to the permanent flame resistant properties of all the fibers within, shall be submitted to the Port Authority.

2. If the material contains fibers which are not inherently flame resistant in the untreated state, a written certification by a recognized independent testing laboratory shall be submitted to the Port Authority, attesting that the treated materials have maintained their flame resistant properties, as determined by the burn test in Section A above, after five (5) washings and/or dry cleanings. The washing test procedure shall be performed as defined by the Technical Manual of the American Association of Textile Chemists and Colorists (AATCC) Test Method 124-1978 using the wash temperature of $120^{o} \pm 5F^{o}$ and the "Tumble Dry" procedure. The dry cleaning test procedure shall be performed by subjecting the material to dry cleaning in a "Coin-Op" machine as manufactured by Norge or Westinghouse or an equal machine. The size sample of material and the machine size are to be commensurable to each other. When necessary, dummy pieces of material shall be added to the test specimens to make up a load equal to the machine rating.

ATTACHMENT A3

SPECIFICATIONS GOVERNING THE FLAMMABILITY OF UPHOLSTERY MATERIALS AND PLASTIC FURNITURE

A. All upholstery materials, including covering, interliner, lining, webbing, cushioning, and padding shall be subject to the vertical flame test as required by Federal Aviation Administration (FAA) Regulation, Section 25.853(b) and Appendix F dated May 1, 1972.

The test method requires that the flame be applied for 12 seconds and then removed, that the average burn length shall not exceed eight (8) inches, that the average flame time after removal of the flame source shall not exceed 15 seconds and that drippings from the test specimen shall not continue to flame for more than an average of five (5) seconds after falling.

Test samples subject to the vertical test shall be tested using the thickness of the material as used in the finished product; except that, the maximum thickness of a test sample shall be one-half inch (1/2") in cases where the final product material exceeds this thickness.

B. Padding that exceeds one-half inch (1/2") thickness and all cushioning in addition to meeting the requirements of Section A above, shall be tested in accordance with the Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source-ASTM E162-78. Wire mesh screen and aluminum foil shall be used as indicated in Section 5.8.1 of this standard test method..

1. Padding and cushioning with a flame propagation index not exceeding 100 is acceptable for use with any external covering that meets the requirements of Section A of this specification.

2. Padding and cushioning with a flame propagation index exceeding 100 may be covered with materials or interliners complying with Section A of this specification. However, the final assembly of these materials which make up the cushion, arm rest, or other parts of the furniture, shall be subject as a composite unit to Standard Test Method ASTM E162-78. Composite assemblies with a flame spread index not exceeding 100 will be acceptable.

C. All self-supporting plastic materials shall be subject to the vertical flame test as required by FAA regulation 25.853(a) and Appendix F dated May 1, 1972. The test method requires that the flame be applied for 60 seconds and then removed, that the average burn length shall not exceed six (6) inches, that the average flame time after removal of the flame source shall not exceed 15 seconds, and that drippings from the test specimens shall not continue to flame for more than an average of three (3) seconds after falling.

D. The thickness of the materials and of the composite assemblies tested under Sections B and C above shall be the same as the thickness used in the finished item. Certification submitted by the manufacturer shall indicate the thickness of the materials as tested.

E. The manufacturer of the finished item shall submit a certification by a recognized, independent, testing laboratory of the results of tests specified above and of the service life of the flame retardancy of a treated material or a certification that the flammability characteristics of the material are inherent therein by virtue of the chemical properties of the material. Treated materials may be used only when the certified flame retardant service life exceeds that of the planned service life of the finished item.

ATTACHMENT A4

SPECIFICATIONS GOVERNING THE FLAMMABILITY OF PLASTIC LAMINATE AND WOOD VENEER FURNITURE

A. Tests and Criteria:

1. Flame spread indices for this specification shall be determined by either ASTM-E-84-79a or ASTM-E-162-78. Flame spread indices shall not exceed 25.

2. The vertical flame test shall be performed in accordance with Federal Aviation Administration (FAA) Regulation, Section 25.853(b) and Appendix F dated May 1, 1972. This test method requires that the flame be applied for 12 seconds and then removed, that the average burn length shall not exceed eight (8) inches, that the average flame time after removal of the flame source shall not exceed 15 seconds, and that drippings from the test specimen shall not continue to flame for more than five (5) seconds after falling.

B. Free Standing Office Partitions:

1. All core and/or structural materials shall be tested and meet the requirements specified in A.1 above.

2. All insulation and covering materials shall be tested and meet the requirements specified in A.2 above.

C. Desk, Tables, Credenzas, Bookcases, etc:

1. All core and/or structural materials shall be tested and meet the requirements specified in A.1 above.

2. Plastic laminate or wood veneer layer materials having a thickness not greater than 1/28 inch shall be tested and meet the requirements specified in A.2 above.

3. Plastic laminates or veneer layer materials having a thickness greater than 1/28 inch shall be subject to the vertical flame test FAA Regulation, Section 25.853(a) or (b), and Appendix F dated May 1, 1972, as determined by the P.A.'s Risk and Environmental Programs Division.

4. The application of intumescent coatings to achieve fire resistance shall be reviewed by the P.A.'s Risk and Environmental Programs Division.

D. Certification.

The supplier of the finished item shall submit a certification and test data by a recognized, independent testing laboratory of the results of the tests specified above. The certification and tests shall cover the materials supplied in the finished product. Proof of use of U.L. labeled products meeting the specified flammability criteria will be acceptable in lieu of the certification.

DESIGN CRITERIA FOR INACCESSIBLE PLASTER CEILINGS

I. LOADING

A. DEAD LOAD (DL) : 15 PSF FOR CEMENT PLASTER AND 10 PSF FOR GYPSUM PLASTER:
   a. USE ACTUAL WHEN GREATER THAN 15 PSF OR 10 PSF, RESPECTIVELY.
B. LIVE LOAD (LL) : 200LBS CONCENTRATED LOAD.
C. WIND LOAD (W) : (EXTERIOR CEILINGS ONLY):
   a. UP TO 50 FT. CEILING HEIGHT: 30 PSF POSITIVE PRESSURE OR 20 PSF SUCTION NORMAL TO SURFACE.
   b. HIGHER THAN 50 FT.: USE WIND FORCES IN ACCORDANCE WITH NEW YORK CITY CODE (NY) OR ANSI A58.1.1982 (NJ).
   c. EACH CEILING PANEL SHALL RESIST A LATERAL WIND FORCE OF 2.5 PSF OR 8.5 PERCENT OF THE POSITIVE WIND PRESSURE, WHICHEVER IS GREATER, ACTING PARALLEL TO THE CEILING SURFACE.
D. LOADING COMBINATIONS:

CEILING COMPONENT	INTERIOR	EXTERIOR
• WIRE TIES • FURRING CHANNEL • CARRYING CHANNEL (MAIN RUNNER)	DL	DL DL + W
• FURRING CHANNEL TO CARRYING CHANNEL (MAIN RUNNER CONNECTION) • HANGER CONNECTIONS • CONNECTION TO STRUCTURE	DL + LL	DL + LL DL + LL + W
• HANGERS	DL + LL	TENSION: DL + LL DL + LL + W (SUCTION) COMPRESSION: DL + W
• BRACING	–	W

A 33 PERCENT INCREASE IN ALLOWABLE STRESSES IS PERMITTED FOR LOADING COMBINATION DL + LL + W ONLY.

II. MATERIALS

A. IN ADDITION TO THE MATERIALS SPECIFIED IN SECTION II, THE FOLLOWING MATERIAL SPECIFICATIONS SHALL BE FOLLOWED:
   1. PLASTER: ASTM C826-81 AND ANSI A42.2.
   2. SURFACE APPLIED BONDING AGENTS FOR EXTERIOR PLASTERING: ASTM C932-80.
   3. LATH: ASTM C841 AND ANSI A42.3.
B. THE FOLLOWING MATERIALS SHALL NOT BE USED:
   1. METAL DECK TABS AND HOOKS.
   2. POWER ACTUATED ANCHORS.
   3. WIRE HANGERS.
   4. STOVE BOLTS.
C. THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT CATALOG CUTS, SAMPLES, LAYOUT DRAWINGS AND DETAILS OF ALL COMPONENTS OF CEILING SUPPORT SYSTEM FOR THE ENGINEER'S APPROVAL PRIOR TO STARTING OF ANY WORK IN THE FIELD.

IV. JOINTS

A. CONTROL JOINTS (DWG. S2-SECT. S6a AND S6b): MAXIMUM LENGTH OF CEILING PANEL BETWEEN CONTROL JOINTS SHALL BE 40 FT. AND MAXIMUM AREA OF THE PANEL SHALL BE 1600 SQ.FT.
B. EXPANSION JOINTS (DWG. S2-SECT. S6 AND S6b): LOCATION AND SIZE OF CEILING EXPANSION JOINTS SHALL MATCH BUILDING EXPANSION JOINTS. EXPANSION JOINTS ARE ALSO REQUIRED WHERE CEILING CHANGES DIRECTION.

II. DESIGN OF CEILING COMPONENTS

CEILING COMPONENT	DESIGN PARAMETER	INTERIOR CEMENT PLASTER CEILINGS	INTERIOR GYPSUM PLASTER CEILINGS	EXTERIOR CEMENT PLASTER SOFFITS	MATERIALS	NOTES
WIRE TIES	MAXIMUM SPACING MINIMUM SIZE	6 INCHES 16 GAGE	6 INCHES 16 GAGE	6 INCHES 16 GAGE	STAINLESS STEEL AISI TYPE 304 OR MONEL METAL	a. MIN. DOUBLE LOOP AROUND LATH AND CHANNEL WITH MIN. THREE TWISTED TURNS. b. IN LIEU OF WIRE TIES, B.S. & A.* OR I.C.B.O.** APPROVED CLIPS MAY BE USED.
FURRING CHANNEL	MAXIMUM SPAN (DIM. W) MAXIMUM SPACING (DIM. F) MINIMUM SIZE	4'-6" 1'-6" 1 1/2" COLD ROLLED CHANNEL (475LBS/1000 LF.)	4'-6" 1'-6" 1 1/2" COLD ROLLED CHANNEL (475LBS/1000 LF.)	4'-6" 1'-6" 1 1/2" COLD ROLLED CHANNEL (475LBS/1000 LF.)	HOT ROLLED ASTM A36 OR COLD ROLLED CHANNELS, GALVANIZED FOR EXTERIOR AND PAINTED FOR INTERIOR.	a. MAX. DEFLECTION < SPAN/360. b. FURRING CHANNELS AND EDGE CASING BEADS SHALL BE INTERRUPTED AT CONTROL AND EXPANSION JOINTS. c. EDGE CASING BEAD AND EDGE BEAM SHALL NOT BE USED AS SUPPORT FOR CEILING d. WHERE LIGHT FIXTURE OPENING REQUIRES CUTTING OF ONE FURRING CHANNEL, SUPPORT THE ENDS WITH 1 1/2" CHANNELS. e. WHERE LIGHT FIXTURE OPENING REQUIRES CUTTING OF MORE THAN ONE FURRING CHANNEL, USE CARRYING CHANNELS AND HANGERS ON EACH SIDE OF THE OPENING. f. FURRING CHANNEL SPLICES SHALL BE AS SHOWN ON DWG. S2-TYPICAL CHANNEL SPLICE DETAIL.
CARRYING CHANNEL	SPACING (DIM. W AVG.) SPAN (DIM.S) SIZE	TABLE 'IP'	TABLE 'IG'	TABLE 'E'	HOT ROLLED ASTM A36 OR COLD ROLLED CHANNELS, GALVANIZED FOR EXTERIOR AND PAINTED FOR INTERIOR.	a. MAX. DEFLECTION < SPAN/360. b. CARRYING CHANNELS SHALL BE INTERRUPTED AT CONTROL AND EXPANSION JOINTS. c. CARRYING CHANNELS SHALL NOT BE INTERRUPTED FOR LIGHT FIXTURE OPENINGS. d. CARRYING CHANNEL SPLICES SHALL BE AS SHOWN ON DWG. S2-TYPICAL CHANNEL SPLICE DETAIL.
FURRING CHANNEL TO CARRYING CHANNEL CONNECTION	MINIMUM SIZE	MIN. 3 LOOPS OF 16 GAGE WIRE OR L 1 1/2 X 1 1/2 X 1/4 X 2 1/2" LONG WITH 3/8"ø A307 BOLTS OR CLIPS WITH B.S. & A. OR I.C.B.O. APPROVAL FOR DESIGN LOADS.	MIN. 3 LOOPS OF 16 GAGE WIRE OR L 1 1/2 X 1 1/2 X 1/4 X 2 1/2" LONG WITH 3/8"ø A307 BOLTS OR CLIPS WITH B.S. & A. OR I.C.B.O. APPROVAL FOR DESIGN LOADS.	MIN. 3 LOOPS OF 16 GAGE WIRE OR L 1 1/2 X 1 1/2 X 1/4 X 2 1/2" LONG WITH 3/8"ø A307 BOLTS OR CLIPS WITH B.S. & A. OR I.C.B.O. APPROVAL FOR DESIGN LOADS.	HOT ROLLED ASTM A36 OR COLD ROLLED CHANNELS, GALVANIZED FOR EXTERIOR AND PAINTED FOR INTERIOR.	SEE DWG. S2-SECTION 3 FOR TYPICAL DETAIL.
HANGER CONNECTIONS	MINIMUM SIZE	ONE 3/8"ø BOLT	ONE 3/8"ø BOLT	ONE 3/8"ø BOLT	A307 BOLTS, NUTS AND LOCK WASHER (GALVANIZED)	SEE DWG. S2-SECTIONS 2 AND 2a FOR TYPICAL DETAILS.
HANGER	MINIMUM SIZE MAXIMUM SPACING	1 1/2 X 1/4" STRAP 4'-6" O.C. EACH WAY ACTUAL SPACING DEPENDS ON CARRYING CHANNEL SIZE-SEE TABLE IP	1 1/2 X 1/4" STRAP 4'-6" O.C. EACH WAY ACTUAL SPACING DEPENDS ON CARRYING CHANNEL SIZE-SEE TABLE IG	L 1 1/2 X 1 1/2 X 1/4" 4'-6" O.C. EACH WAY ACTUAL SPACING DEPENDS ON CARRYING CHANNEL SIZE-SEE TABLE E	HOT ROLLED ASTM A36 STEEL, GALVANIZED FOR EXTERIOR AND PAINTED FOR INTERIOR	a. HANGER SPLICES SHALL HAVE A MINIMUM OF 2-3/8"ø BOLTS WITH NUTS AND LOCK WASHERS b. HANGER SHALL BE VERTICALLY PLUMB.
CONNECTION TO STRUCTURE		SEE DRAWING S3	SEE DRAWING S3	SEE DRAWING S3	SEE DRAWING S3	MINIMUM THICKNESS OF STEEL MEMBERS FOR EXTERIOR SOFFITS SHALL BE 1/2".
BRACING		NONE REQUIRED	NONE REQUIRED	MIN. TWO BRACINGS IN EACH DIRECTION PER PANEL		SEE DWG. S2-SECTIONS S4 AND S5.

NOTE: IN CASES WHERE ACTUAL LOADS ARE HIGHER THAN SPECIFIED UNDER LOADING (SECTION I) DESIGN SHALL BE PREPARED IN ACCORDANCE WITH THE DESIGN PROCEDURES FOR RUNNER CHANNELS (METAL LATH MANUFACTURERS ASSOCIATION).

* BOARD OF STANDARDS AND APPEALS OF NEW YORK CITY.
** INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS.

MINIMUM SIZE OF CARRYING CHANNEL FOR INTERIOR INACCESSIBLE PLASTER CEILINGS

TABLE "IP"

'W' AVERAGE / 'S'	3'-6"	3'-9"	4'-0"	4'-3"	4'-6"
3'-1"	1 1/2" C.R.-[475LBS/ 1000 L.F.				
3'-3"	1 1/2" CHANNEL (HOT ROLLED) MINIMUM WEIGHT = 1120LBS./1000 L.F.				
3'-9"					
4'-0"					
4'-2"					2" CHANNEL (HOT ROLLED) MINIMUM WEIGHT = 1260LBS./1000 L.F.
4'-6"					

SIZES, SPANS AND SPACINGS SHOWN ARE FOR DEAD LOAD = 15 PSF.

MINIMUM SIZE OF CARRYING CHANNEL FOR INTERIOR INACCESSIBLE GYPSUM PLASTER CEILINGS

TABLE "IG"

'W' AVERAGE / 'S'	3'-6"	3'-9"	4'-0"	4'-3"	4'-6"
2'-9"	1 1/2" CHANNEL (COLD ROLLED) MINIMUM WEIGHT = 475LBS/1000 L.F.				
3'-0"					
3'-6"					
4'-0"					1 1/2" CHANNEL (HOT ROLLED) MINIMUM WEIGHT = 1120LBS/1000 L.F.
4'-6"					

SIZES, SPANS AND SPACINGS SHOWN ARE FOR DEAD LOAD = 10 PSF.

MINIMUM SIZE OF CARRYING CHANNEL FOR EXTERIOR INACCESSIBLE PLASTER SOFFITS

TABLE "E"

'W' AVERAGE / 'S'	3'-0"	3'-3"	3'-6"	3'-9"	4'-0"	4'-6"
2'-1"	1 1/2" CHANNEL (HOT ROLLED) MINIMUM WEIGHT = 1120LBS/1000 L.F.					
2'-4"						
2'-6"				2" CHANNEL (HOT ROLLED) MINIMUM WEIGHT = 1260LBS/1000LBS L.F.		
2'-8"						
3'-1"						
3'-6"					2 1/2" CHANNEL (HOT ROLLED) MINIMUM WT. 2270LBS/1000 L.F.	
4'-0"						

SIZES, SPANS AND SPACINGS SHOWN ARE FOR 15 PSF DEAD LOAD + 20 PSF WIND SUCTION.

Sheet 1 of 3

THE PORT AUTHORITY OF NY & NJ

ORIGINAL SIGNED BY:
CHIEF STRUCTURAL ENGINEER

Title
PLASTER CEILING DESIGN STANDARDS

No	Date	Revision	Approved

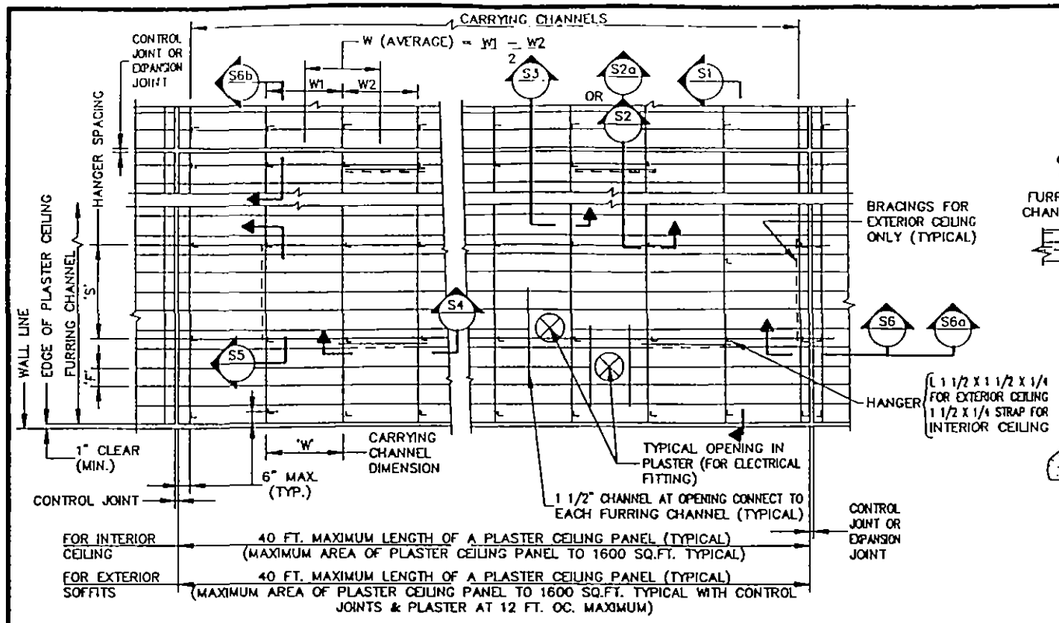
This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

H. PATEL — Designed by
D. MOCK — Drawn by
H. PATEL — Task Leader

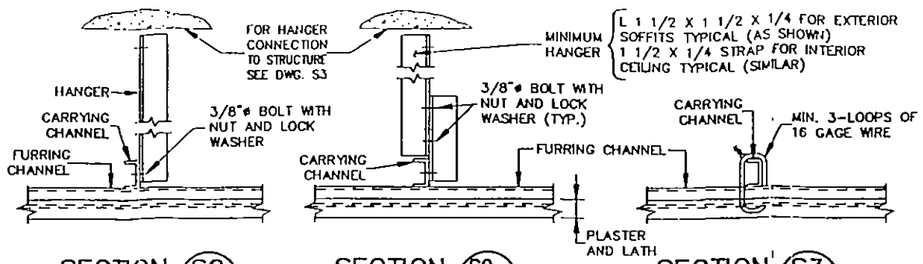
Date OCT. 15, 85

Contract Number

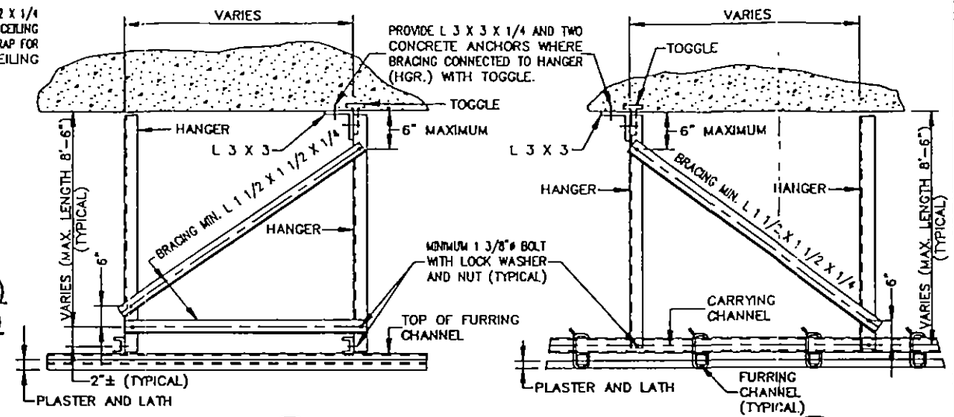
Drawing Number
S1



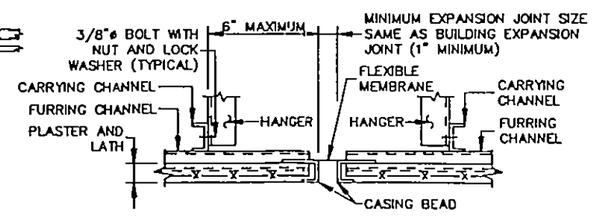
TYPICAL PLAN – EXTERIOR (INACCESSIBLE) PLASTER SOFFITS (SHOWN)
TYPICAL PLAN – INTERIOR (INACCESSIBLE) PLASTER CEILING (SIMILAR)



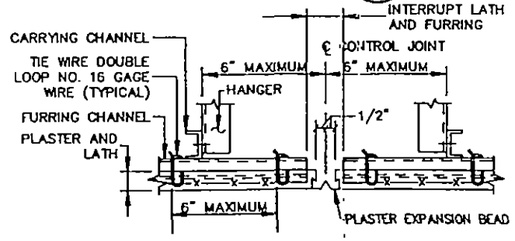
SECTION S2 SECTION S2a SECTION S3



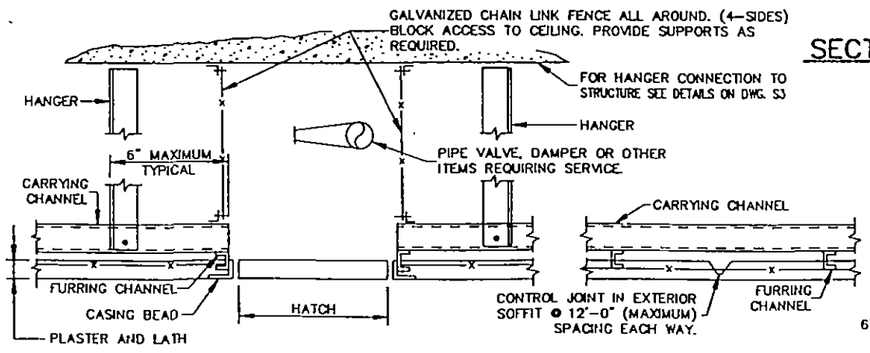
SECTION S4 SECTION S5



SECTION S6 TYPICAL EXPANSION JOINT

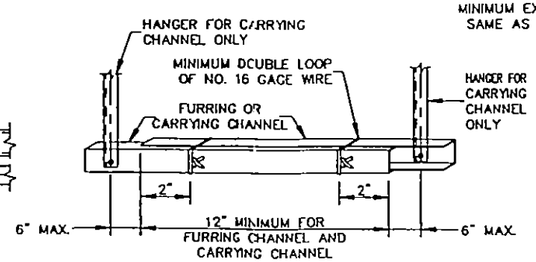


SECTION S6a TYP. CONTROL JOINT

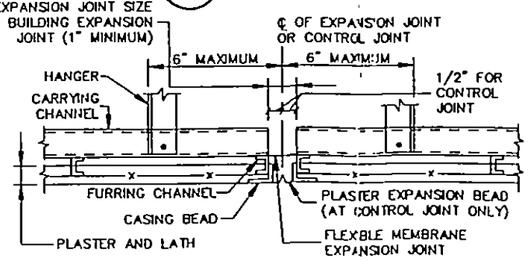


TYPICAL HATCH DETAIL

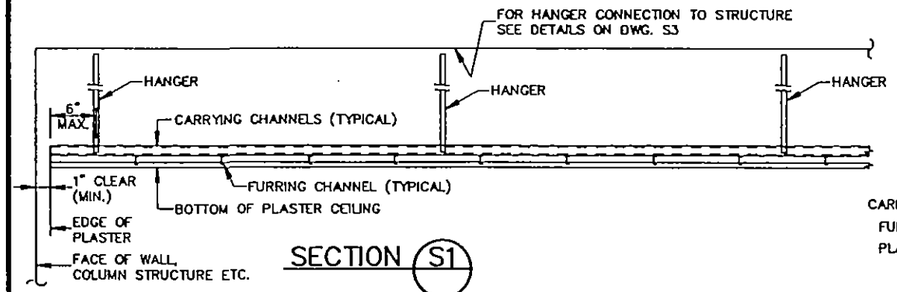
TYPICAL CONTROL JOINT DETAIL IN PLASTER



TYPICAL CHANNEL SPLICE DETAIL



SECTION S6b TYP. EXPANSION JOINT OR CONTROL JT. DET.



SECTION S1

Sheet 2 of 3

THE PORT AUTHORITY OF NY & NJ

ORIGINAL SIGNED BY:
CHIEF STRUCTURAL ENGINEER

Title
PLASTER CEILING DESIGN STANDARDS

No	Date	Revision	Approved

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

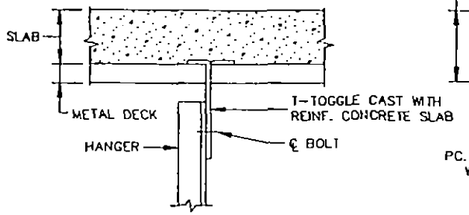
H. PATEL	O. MOCK	H. PATEL
Designed by	Drawn by	Task Leader

Date OCT. 15, 85

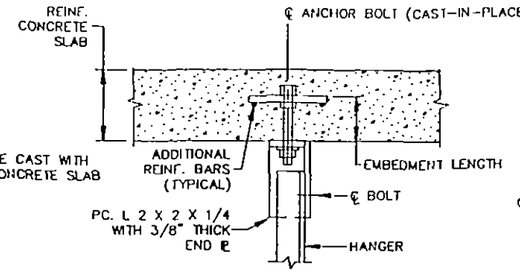
Contract Number

Drawing Number S2

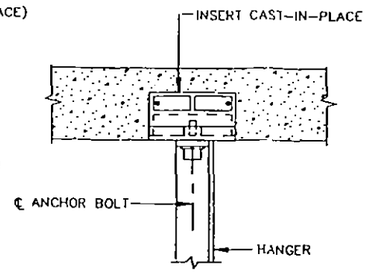
TYPICAL DETAILS FOR HANGER CONNECTION TO STRUCTURE



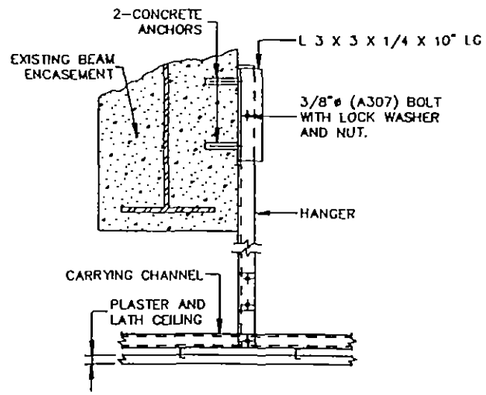
DETAIL – A
TOGGLE IN CONCRETE SLAB OVER METAL DECK



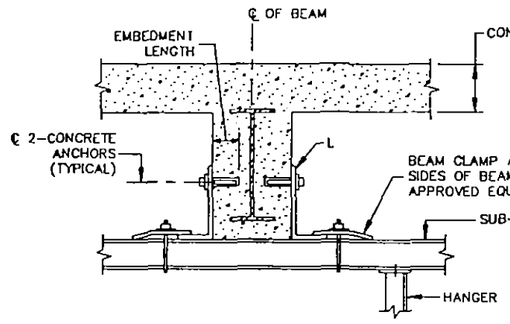
DETAIL – B
CAST IN ANCHOR BOLT IN CONCRETE SLAB



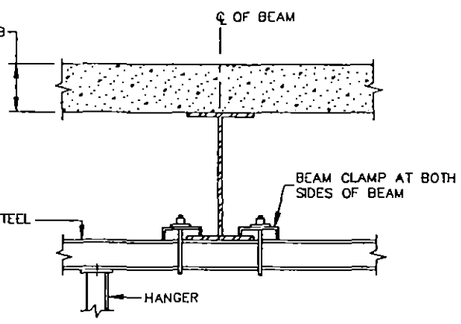
DETAIL – C
INSERT IN CONCRETE SLAB



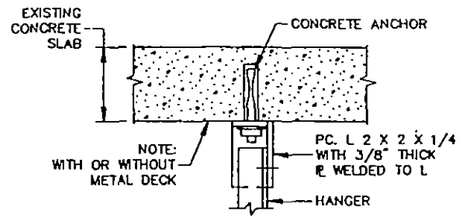
DETAIL – D
CONCRETE ANCHORS IN ENCASED STEEL BEAM



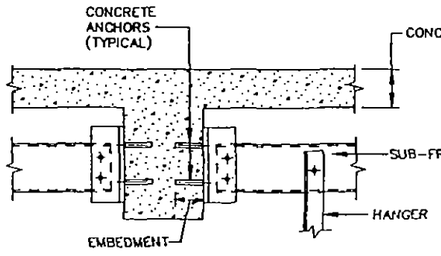
DETAIL – F
SUBFRAMING AT ENCASED BEAM



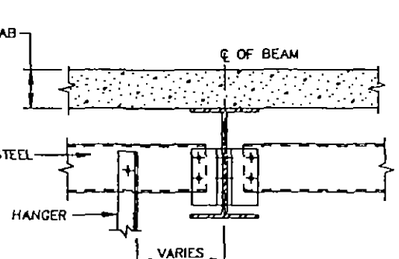
DETAIL – G
SUBFRAMING CLAMPED TO STEEL BEAM



DETAIL – E
CONCRETE ANCHOR IN SLAB



DETAIL – H
SUBFRAMING AT CONCRETE BEAM



DETAIL – I
SUBFRAMING CONNECTED TO STEEL BEAM

CONNECTION TO STRUCTURE–MATERIALS

1. T-TOGGLES (DETAIL A):
   GALVANIZED, MINIMUM SIZE 1 1/2" X 1/4" USE WITH NEW SLAB CONSTRUCTION WITH METAL DECK.

2. CONCRETE INSERTS (DETAILS B AND C):
   USE WITH NEW SLAB CONSTRUCTION WITHOUT METAL DECK.

   ACCEPTABLE TYPES:
   UNISTRUT – P3200 SERIES, P3300 SERIES AND M24 (SPCT).
   B-LINE – B2505.
   DAYTON – SUPERIOR-F14 OR APPROVED EQUAL.

3. CONCRETE ANCHORS (DETAILS D AND E):

   ACCEPTABLE TYPES:
   HILTI – HSL AND HSLB.
   LIEBIG – SAFETY BOLTS.

4. STEEL SUB-FRAMING (DETAILS F, G, H AND I):
   DESIGN IN ACCORDANCE WITH AISC OR AISI (COLD FORMED).

Sheet 3 of 3

THE PORT AUTHORITY OF NY & NJ

ORIGINAL SIGNED BY:
CHIEF STRUCTURAL ENGINEER

Title
PLASTER CEILING DESIGN STANDARDS

No	Date	Revision	Approved

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

H. PATEL	D. MOCK	H. PATEL
Designed by	Drawn by	Task Leader

Date OCT. 15, 65

Contract Number

Drawing Number
S3

ATTACHMENT S2 SUSPENDED LIGHTWEIGHT CEILINGS DESIGN CRITERIA IN NEW JERSEY

The design and installation of all lightweight ceiling components, except hangers and their top and bottom connections, shall comply with:

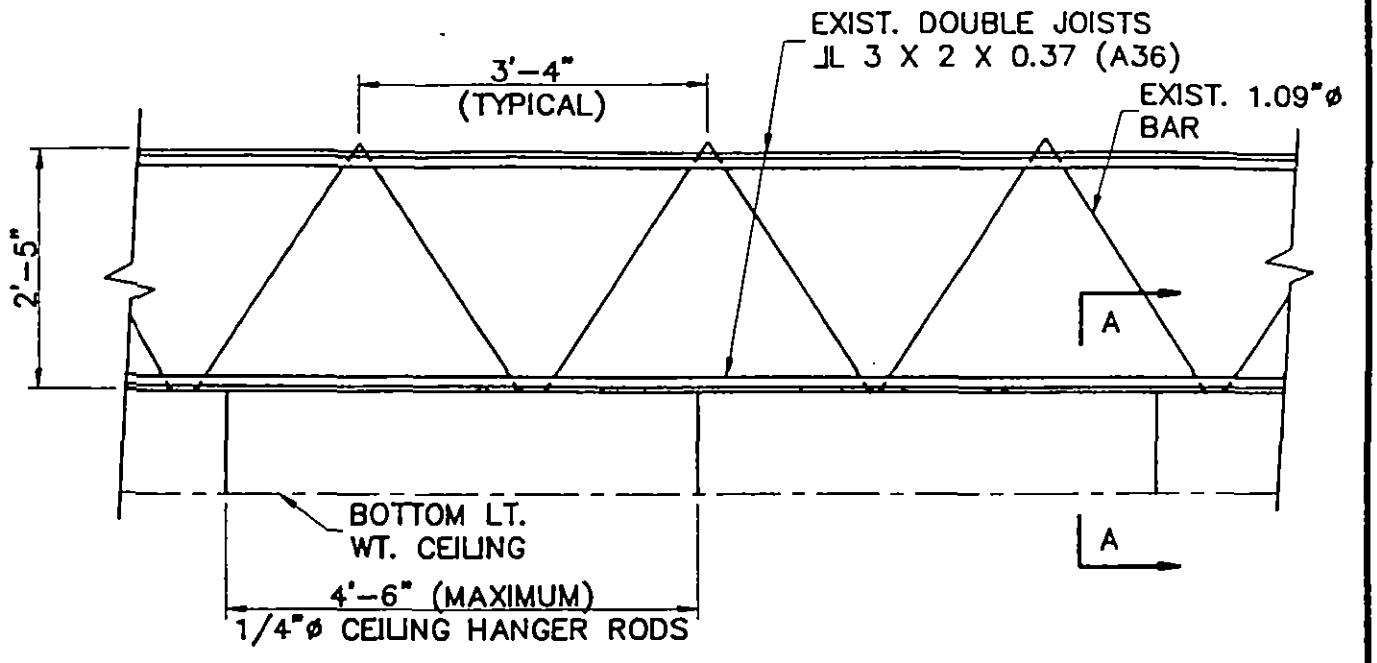
ASTM C635	Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
ASTM C636	Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels

For the design and installation of hangers and their top and bottom connections, revise the above ASTM Standards as follows:

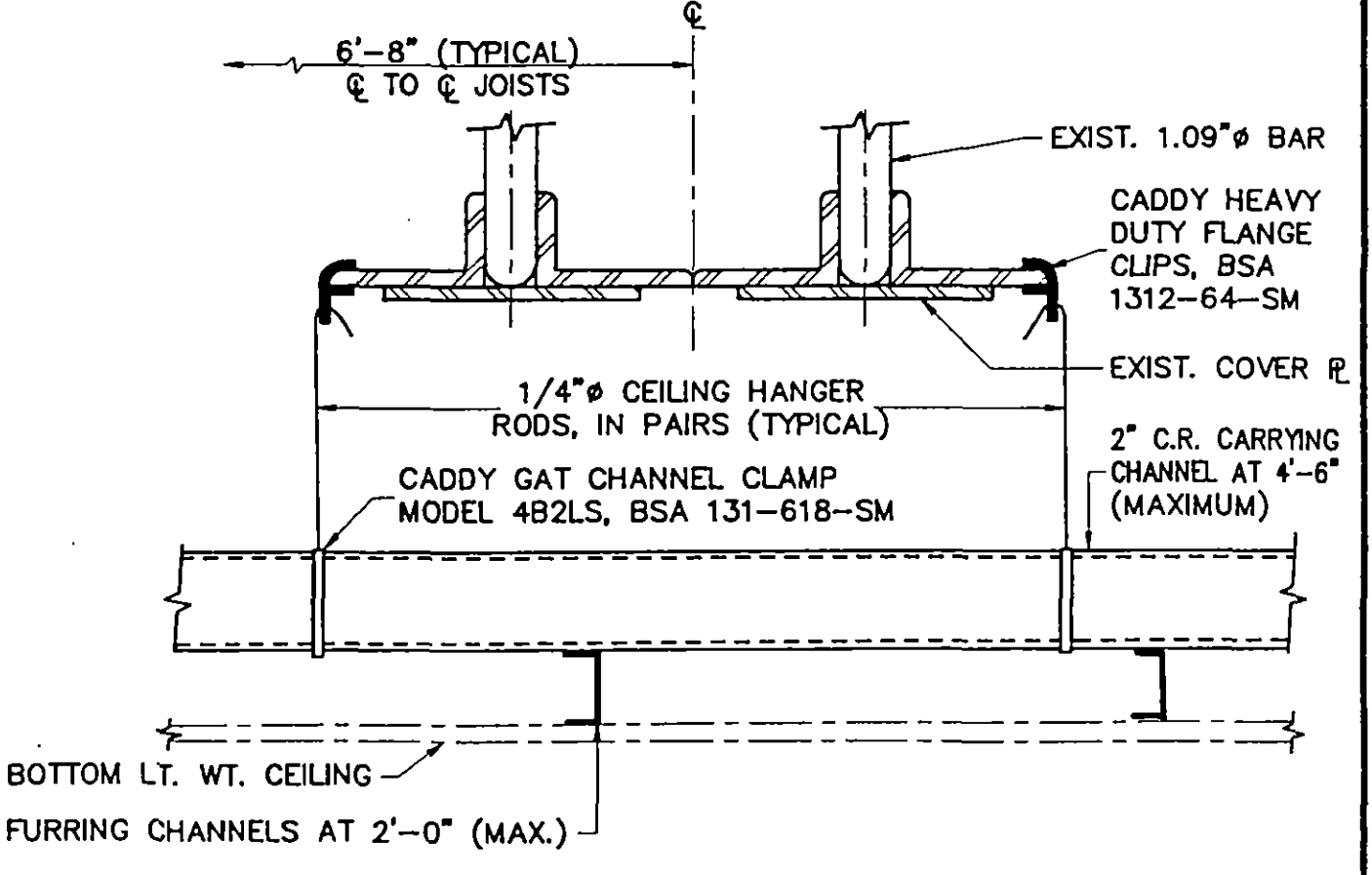
a. The hanger and its connections shall safely carry the total supported load plus 200 pounds. The additional loading is consistent with fire department recommendations to avoid progressive collapses.

b. Hangers for suspending carrying channels or main runners from an existing structure shall be 1/4-inch diameter galvanized steel rods, 1/8" x 1" galvanized steel flat bars, or Number 9-gauge galvanized, soft-annealed, mild steel wire.

c. Metal deck tabs shall not be allowed as a top hanger connection.



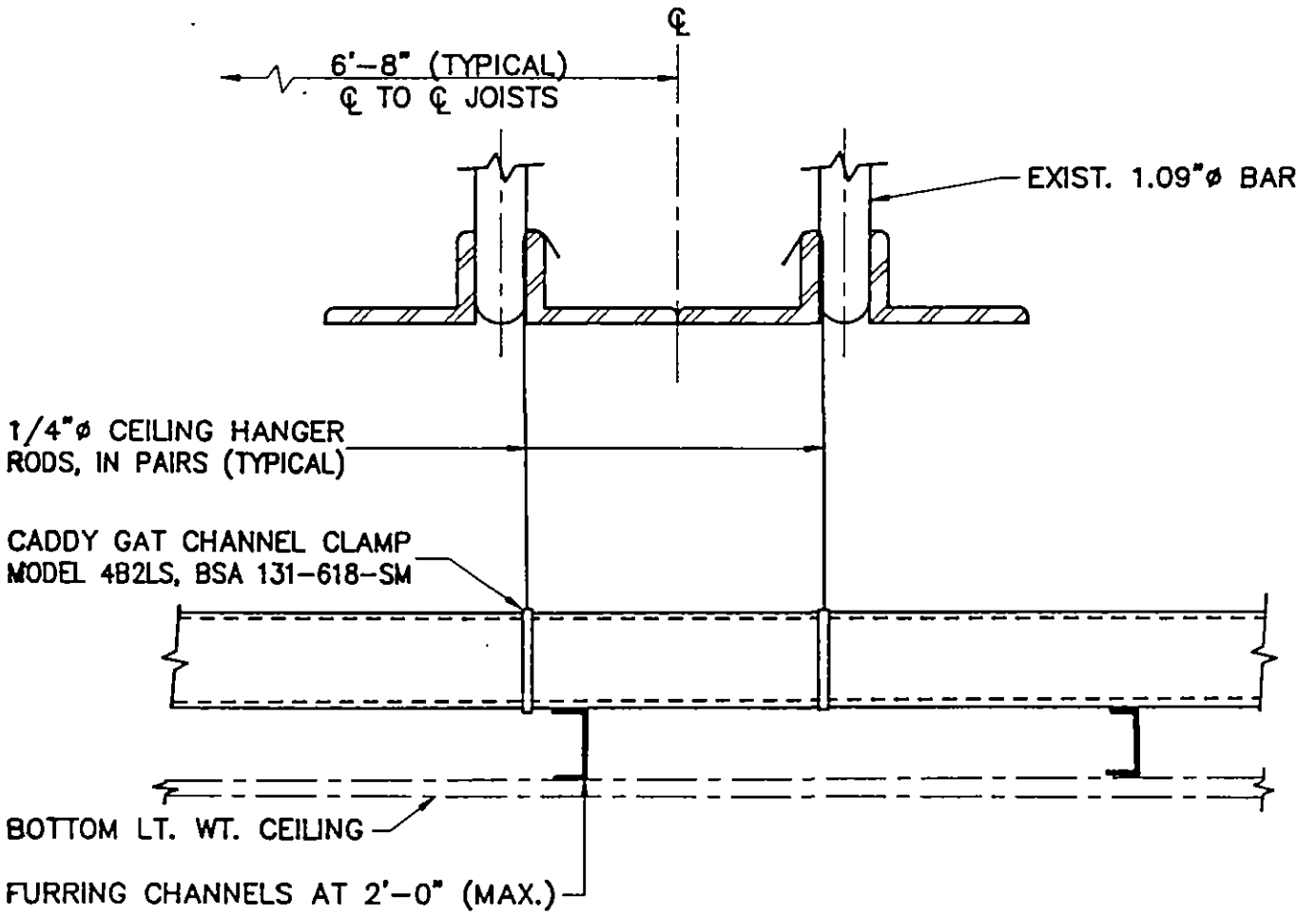
PART ELEVATION



SECTION A-A
CEILING SUPPORT DETAIL
FOR JOIST WITH COVER PLATE

WORLD TRADE CENTER LIGHTWEIGHT CEILING
STANDARD CEILING CONNECTION TO
EXISTING FLOOR JOISTS

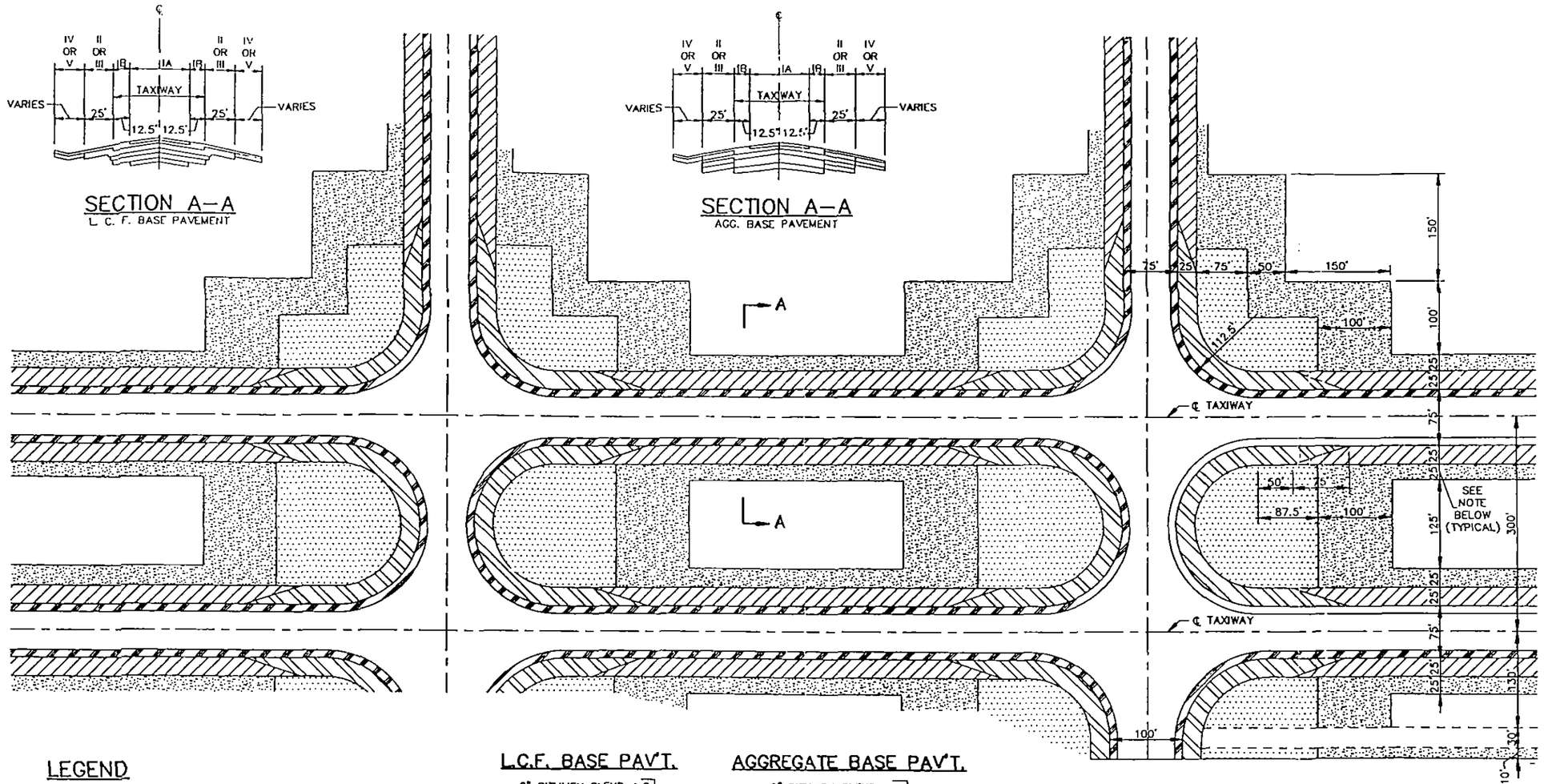
SK-LWC1



CEILING SUPPORT DETAIL
FOR JOIST WITHOUT COVER PLATE

WORLD TRADE CENTER LIGHTWEIGHT CEILING
STANDARD CEILING CONNECTION TO
EXISTING FLOOR JOISTS

SK–LWC2



LEGEND

		L.C.F. BASE PAV'T.	AGGREGATE BASE PAV'T.
IA	TAXIWAY PAVEMENT KEEL SECTION	2" BITUMEN BLEND A.C. 2" A.C. 8" L.C.F. "A" 8" L.C.F. "B" 6" L.C.F. "B" 6" L.C.F. "C" TOTAL 32"	2" BITUMEN BLEND A.C. 2" A.C. 4" A.C. BINDER 16" P.M. 14" D.G.A.B.C. TOTAL 38"
IB	TAXIWAY PAVEMENT	4" A.C. 8" L.C.F. "A" 8" L.C.F. "B" 8" L.C.F. "B" TOTAL 28"	4" A.C. TOP COURSE 4" A.C. BINDER 16" P.M. 14" D.G.A.B.C. TOTAL 38"
II	ADDITIONAL FULL STRENGTH T/W PVMT (HEAVY SHOULDER)	3" A.C. 8" L.C.F. "A" 6" L.C.F. "B" 6" L.C.F. "C" TOTAL 23"	4" A.C. TOP COURSE 2" A.C. BINDER 10" P.M. 12" D.G.A.B.C. TOTAL 28"
III	SHOULDER PAVEMENT	3" A.C. 6" L.C.F. "A" 6" L.C.F. "C" TOTAL 15"	2" A.C. TOP COURSE 2" A.C. BINDER 6" P.M. 8" D.G.A.B.C. TOTAL 18"
IV	HIGH VELOCITY STABILIZATION	3" A.C. 8" L.C.F. "A" TOTAL 11"	3" A.C. 4" P.M. 6" D.G.A.B.C. TOTAL 13"
V	LOW VELOCITY STABILIZATION	2" A.C. 8" L.C.F. "C" TOTAL 10"	2" A.C. 4" P.M. 6" D.G.A.B.C. TOTAL 12"

NOTE: 22.5 FEET FOR NEWARK INTERNATIONAL AIRPORT

TAXIWAY PAVING REQUIREMENTS
FOR B–747 – DESIGN AIRCRAFT

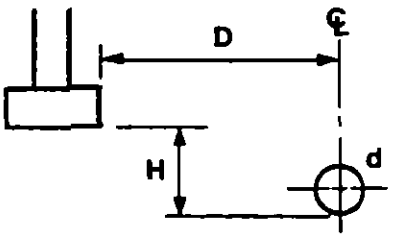
ATTACHMENT C2 PROTECTION OF STEEL OR CAST IRON UNDERGROUND PIPE

REM - RELOCATION OF ENCASEMENT MANDATORY
STS - SUBJECT TO STUDY
NER - NO ENCASEMENT REQUIRED

R - RELOCATE
E - ENCASEMENT REQUIRED

	NEW	EXISTING
A. RAILROADS	REM	STS REM
B. HIGHWAYS		
(Terminal building frontage fits in this category)	REM	REM
C. LOCAL STREETS	NER	NER
D. UNDER BUILDINGS		
1. Spread footings	R	R
2. Piles - Framed slab		
a. Pipe < 12" diameter	REM	R
b. Pipe > 12" diameter	REM	STS
3. Piles - Slab on grade		
a. L.L. > 200 psf		
i. Pipe > 12" diameter	R	R
ii. Pipe < 12" diameter	STS	STS (R or E)
b. L.L. < 200 psf		
i. Pipe > 12" diameter	STS	STS (E)
ii. Pipe < 12" diameter	NER	NER
4. Floor tied	STS	STS

E. NEAR BUILDING FOUNDATIONS



H = 0 for pile foundation
d = pipe diameter

1.	Where $D > 2H + 2d^2$	NER	NER
2.	Where $D < 2H + 2d^2$		
	a. Spread footings	R	R
	b. Piles		
	i. $d >$ 12" diameter	E	E
	ii. $d <$ 12" diameter	REM	REM

F. 747 LOADING

1.	Runways	REM	REM
2.	Taxiways		
	a. PAF	REM	REM
	b. Local	REM	REM
3.	Taxiway Stubs	STS	STS
4.	Aprons		
	a. Poor pavement (< 13" Concrete; < 28" Flexible Pavement)	STS	STS
	b. Good cover	NER	NER
	c. Less than 6' cover	STS	STS
5.	Gate positions	REM	REM

ATTACHMENT M1 BUS TERMINAL SOUTH WING TENANT HVAC DESIGN CRITERIA

The following is a compilation of Design Criteria that will permit the Lessee to properly size and design his HVAC and smoke purge systems to meet the Port Authority (P.A.) Standards for the Bus Terminal.

A. OUTSIDE AIR

A duct will provide each leasehold with outside air filtered and pre-heated to a 37°F minimum, if required. The final design criteria for the air will be:

1. Summer Cycle: Minimum flow of 0.30 cfm/sf.

2. Winter Cycle: Minimum O.A. is 0.30 cfm/sf.

   Maximum O.A. is 1.2 cfm/sf.

3. Supply Pressure: Not less than 0.00 inches water.

B. SPILL AIR

A duct connection will be provided for each leasehold not having direct access to louvers, allowing for discharge of spill air directly to the outside.

Spill air CFM should equal outside air CFM less any local exhaust, and a nominal (±10%) exfiltration allowance.

Return or spill air fan shall be sized to satisfy the smoke purge requirements as described under smoke purge systems, or a separate smoke purge fan shall be provided by the Tenant.

C. CHILLED WATER

Valved supply and return outlets will be provided by the P.A. with capacity as follows: To maintain a leasehold of 78°F, 50% RH, with 0.30 cfm/sf outside air at 91°F DB, 75°F WB, 6 watts/sf electrical load, 50 sf/person occupancy, plus exposure, solar and transmission, where such exists.

Chilled water temperature: Supply is 45°F, return is 60°F. Pressure differential between supply and return is 12 psi, and working pressure is 125 psi. The Control valve operation shall be sized to shut the valve against a 50 psig differential. Each leasehold has a drain connection for the cooling coil.

D. STEAM

A valved connection for steam will be provided with 0 psi at the point of connection. A condensate return line will also be provided by the P.A. for connection by the Tenant.

E. SMOKE PURGE FAN

The Tenant shall install a new exhaust fan to provide exhaust at a minimum of 1.5 cfm/sf for a store with a closed storefront, or a minimum 200 foot/minute velocity through an open storefront, when smoke purge has been automatically or manually activated.

F. SMOKE PURGE DUCT

1. Exhaust fan, discharge damper, louver and duct connection to outdoors shall be installed by the Tenant.

2. Where applicable and adequate size is available, the present outdoor air duct, damper and louver may be used as a smoke purge exhaust duct.

G. RELIEF DUCT TO CONCOURSE

The Lessee shall provide a damper in relief transfer duct(s) from the Tenant space to the concourse.

H. TEMPERED AIR SUPPLY

A capped connection is provided from a tempered air duct in the concourse ceiling. The Tenant shall install all duct work to his A/C equipment.

I. ELECTRICAL WIRING

1. Power to the smoke detection installation shall be taken through a fuse box from the line side of the electrical panel.

2. Electrical work for the smoke detection system, local alarm, central alarm to multiplex terminal, and the fan actuation and running indication shall be by the Tenant.

J. GENERAL

1. The Tenant HVAC systems are to be designed so that conditioned air is not taken from air conditioned public spaces.

2. The Tenant shall provide complete automatic temperature controls to control the space conditions in his area.

3. Chilled water will be shut down during the winter season.

4. A time clock shall be provided for off-hours A.C. shutdown by the Tenant.

5. The Tenant shall install automatic dampers for temperature control and smoke purge requirements.

K. SMOKE DETECTORS

1. HVAC Smoke Detectors: The Tenant shall provide a PYR-A-LARM Model DA-1 "ion chamber" smoke detector in the return air duct, as well as downstream of the filters in the air handling unit supply duct. In addition, area smoke detectors, PYR-A-LARM DI-25, will be required on the basis of (1) area detector per 1600 sf, minimum.

2. HVAC and Area Smoke Detectors shall:

   a. Provide an audio-visual signal at the local alarm panel.

   b. Activate the smoke purge mode of the Tenant A.C. system.

L. HVAC CONTROL - SMOKE PURGE MODE

1. Automatic Operation (Smoke Purge):

   Upon activation of an HVAC or area smoke detector, an alarm shall be initiated, the supply air fan shall stop, the outside air and return air dampers shall close, the spill air and relief dampers shall fully open, and the return air fan or smoke purge fan shall keep running, by-passing any other controls.

   In case activation of the area smoke detector occurs at night when the A.C. system is off, the spill-air/return-air fan shall start and position the dampers as described above.

2. Manual Operation:

   a. Local Manual Control shall originate from a Local Control Panel.

   b. Provision shall also be made for accomplishing the Tenant purge cycle from the remote manual control originating at the emergency break glass switch.

M. LOCAL CONTROL PANEL AND EMERGENCY POWER SUPPLY

1. The Local Control Panel shall be Model CP-70 with two (2) "snap-in" PC boards, Model Number AR-70 as manufactured by Pyrotronics or approved equal, and shall be compatible to the Bus Terminal Extension System "Fire Com 8000" as manufactured by Fire Controls, Inc.

2. Emergency Power Supply for Local Control Panel shall be Model Number EP-4.

3. The Local Control Panel shall be wired with provisions for tie-in with the Building's Central Smoke Detection System.

4. All equipment and wiring contained within the Panel shall be accessible from the front of the steel cabinet after the hinged door panel is opened. The Panel shall house the following additional equipment:

   a. Two 120 VAC, 60 Hz, single phase, red indicating lights with glass lenses type PTL as manufactured by Micro Switch. These lights shall be mounted on the door of the Local Control Panel and each light shall be labeled with an approved nameplate (for Equipment Malfunction Indication).

   b. Three (3) auxiliary control relays for 120 VAC, 60 Hz, single phase supply provided with 3NO and 3NC convertible contacts and rated 10 amps, 60 VAC, Type RY as manufactured by Micro Switch (For Smoke Purge Activation and R.A. Damper Closing).

   c. A terminal strip of sufficient size and number of points to receive wiring.

N. MANUAL BREAK GLASS EMERGENCY SWITCH (TENANT SPACES)

Install a manual break glass emergency switch, heavy duty double pole NC, rated 6 amps - 125V, for semi-flush mounting, provided with an engraved nameplate with the legend "EMERGENCY SMOKE PURGE." The switch shall be ACME Type 790 as manufactured by the Acme Fire Alarm Co.

ATTACHMENT M2 BUS TERMINAL NORTH WING TENANT HVAC DESIGN CRITERIA

A. OUTSIDE AIR

A capped duct will provide outside air filtered and pre-heated to a 37°F minimum if required, as follows:

1. Summer Cycle:

   Minimum flow of 0.30 cfm/sf.

2. Winter Cycle:

   Minimum O.A. is 0.30 cfm/sf.

   Maximum O.A. is 1.2 cfm/sf.

3. Supply pressure: Not less than 0.00 inches water.

B. SPILL AIR

A capped duct will be provided for each leasehold not having direct access to louvers, allowing for the discharge of spill air directly to the outside.

Spill air CFM should equal outside air CFM less any local exhaust, and a nominal (±10%) exfiltration allowance.

Return or spill air fan shall be sized to satisfy the smoke purge requirements as described under smoke purge systems, or a separate smoke purge fan shall be provided.

C. CHILLED WATER

Valved supply and return outlets will be provided as follows: To maintain a leasehold of 78°F, 50% RH, with 0.30 cfm/sf outside air at 91°F DB, 75°F WB, 6 watts/sf electrical load, 50 sf/person occupancy, plus exposure, solar and transmission, where such exists.

Chilled water temperature: Supply is 45°F, return is 60°F.

Pressure differential between supply and return is 12 psi, working pressure is 125 psi. Control valve operator shall be sized to shut the valve against a 50 psig differential pressure.

D. HEATING HOT WATER

Valved supply and return outlets will be provided as follows:

To provide heating capacity for the Tenant HVAC system such that a 70°F leasehold is maintained with 11°F outdoor.

Heating hot water range is 180°F supply, 140°F return.

Pressure differential between supply and return is 6 psi, working pressure is 125 psi. Control valve operator shall be sized to shut the valve against a 50 psig differential pressure.

A baseboard radiation heating system is provided for leasehold(s) exposed to the outdoors, to maintain a 50°F minimum leasehold with 0°F outdoors, when the Tenant HVAC system is not operating.

E. HVAC CONTROLS

The Tenant shall provide complete automatic temperature controls to control the space conditions in his area. Chilled water will be shut down during the winter season. A time clock shall be provided for off hours A.C. shutdown.

The Tenant shall provide automatic dampers in accordance with the typical fan and damper arrangement schematic. Only two-way valves shall be provided for the chilled water and hot water coils control.

F. GENERAL

Tenant HVAC systems are to be designed so that conditioned air is not taken from air conditioned public spaces.

G. SMOKE DETECTORS

1. HVAC Smoke Detectors: The Tenant shall provide an "ion chamber" smoke detector in the return air duct, as well as downstream of the filters, in the air handling unit supply duct.

2. HVAC and Area Smoke Detectors shall:

   a. Provide an audio-visual signal at the local alarm panel.

   b. Activate the smoke purge mode of the Tenant A.C. system.

The local alarm panel shall be wired to the nearest building junction box for future tie-in with the central alarm system. Detectors shall conform to electrical design criteria specifications. The power source shall comply with the requirements of New York City Building Code Reference Standard RS 17-3.

H. SMOKE PURGE MODE

1. Automatic Operation:

Upon activation of an HVAC or area smoke detector, the supply air fan shall stop, the outside air and return air dampers shall close, the spill air damper shall fully open, and the return air fan or smoke purge fan shall keep running, by-passing any other controls.

In case activation of an area smoke detector occurs at night when the A.C. system is off, the return air fan shall start and position the dampers as described above.

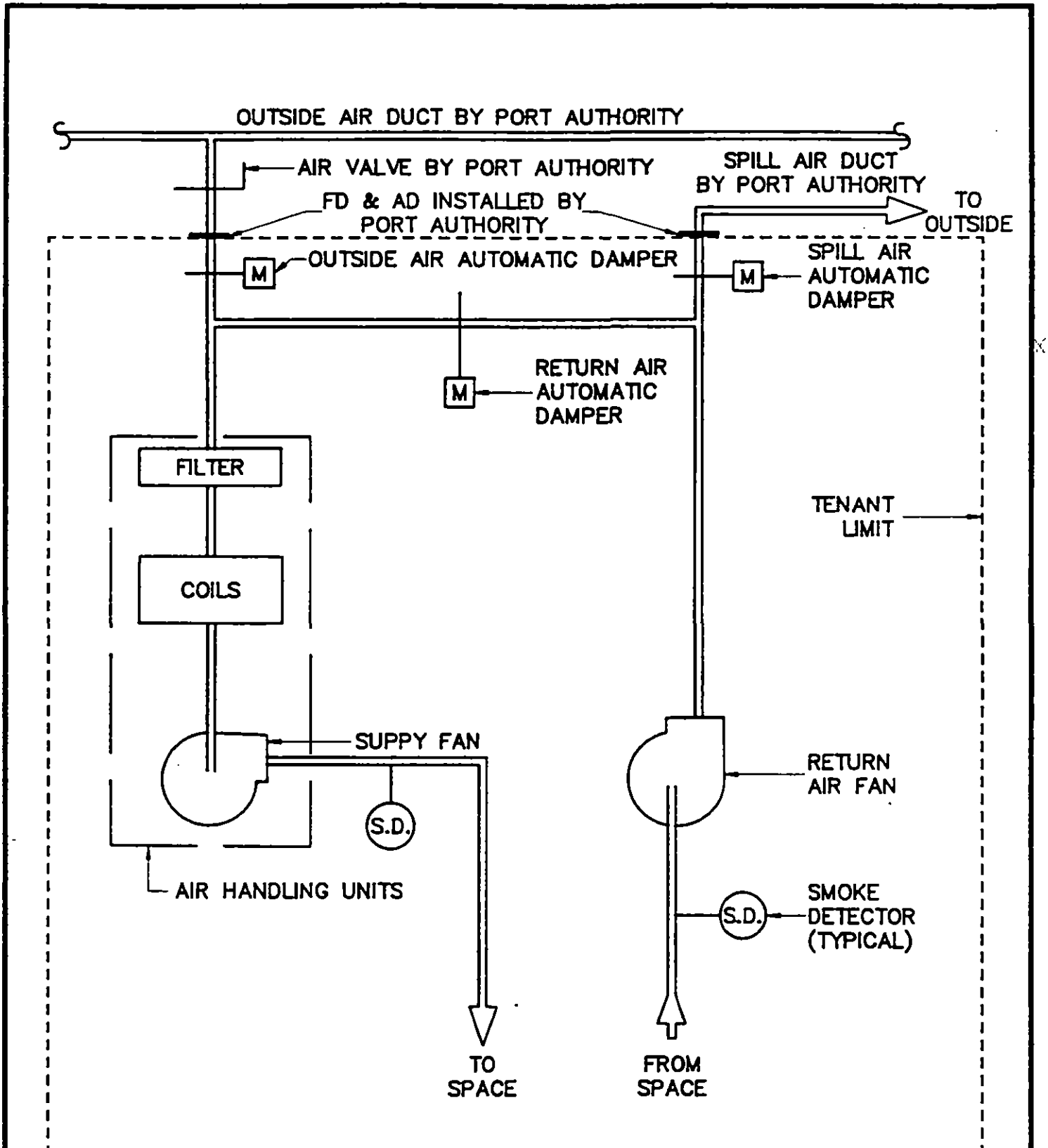
2. Manual Operation:

a. Local control station for all equipment (no smoke purge button).

b. Remote smoke purge button for each Tenant with a console indication. Console controls and alarms for Tenant equipment, in addition to smoke purge control.

I. The capacity of the smoke purge system shall be determined by the Tenant to maintain a minimum air velocity of 200 fpm through any storefront opening leading to the public areas which could not be closed during fire.

J. Tenants requiring kitchen exhaust systems shall provide New York City approved vapor collectors and fire barriers for the kitchen range hoods.



PORT AUTHORITY BUS TERMINAL
TENANT AREAS – HVAC CRITERIA
TYPICAL FAN & DAMPER ARRANGEMENT

ATTACHMENT M3 BUS TERMINAL TENANT ELECTRICAL DESIGN CRITERIA

A. ELECTRICAL SERVICE

1. Rent Inclusion:

   A 265/460 volt feeder in a conduit sized for the anticipated Tenant load, and terminated in a junction box, will be installed from the Bus Terminal point of electrical distribution to the perimeter of the leasehold. All electrical distribution, step-down transformers, wiring, panels, and lighting are provided by the Tenant.

2. Metered Service:

   A conduit sized for the anticipated Tenant load, and terminated in a junction box, will be installed from the 265/460 volt Tenant Switchboard in the Switchgear room of the Subway Mezzanine to the perimeter of the leasehold. All electrical distribution, step-down transformers, wiring, panels, and lighting, except metering equipment and meter, are provided by the Tenant.

B. HVAC SMOKE DETECTORS

The Tenant shall provide smoke detectors in the HVAC systems which have been listed by Underwriters Laboratories, and approved by the New York City Board of Standards and Appeals for the particular application. Detectors shall sense "products of combustion." Detectors shall not be subject to an alarm due to the rapid change of humidity. The quality and quantity of ionization material shall be such that it shall not be considered dangerous if lost, nor shall it require licensing from the Nuclear Regulatory Commission. All of the detectors shall have their locations and operation as described in the HVAC Design Criteria.

C. AREA SMOKE DETECTORS

Provide an "ion chamber" smoke detector over each leasehold entrance to the public corridors. Detector(s) shall sense "product-of-combustion" gases and shall have an operation as described in the HVAC Design Criteria.

D. SPRINKLER ALARMS

Flow alarms have been provided by the Port Authority and are not required under these specifications. However, should the Tenant require his own internal alarm, he must conform to the specifications section titled "Local Alarm Panel."

E. LOCAL ALARM PANEL

The local alarm panel shall be furnished and installed by the Tenant within his leasehold to provide the following functions:

1. Provide audio-visual alarms signaling the actuation of the smoke purge within the leasehold. The entire local alarm system shall have a trouble alarm indicating malfunction of the system.

2. The local alarm panel shall be tied into the Bus Terminal central alarm system for remote smoke (fire) alarm, remote trouble indication, and the remote manual on/off controls for the "smoke purge mode" as described in the HVAC Design Criteria. The Tenant, at his expense, shall provide and install a one-inch(1") conduit with seven (7) Number 12 wires from the local alarm panel to the nearest Bus Terminal junction box as directed, to maintain continuous surveillance of this system by the Bus Terminal. The Tenant, at his expense, shall provide an emergency source of power that would automatically operate upon loss of normal power.

3. The local alarm panel shall be provided with auxiliary contacts and/or control gear for all remote functions.

4. When the Tenant requires a security system within his area, it may also be tied into the Bus Terminal central alarm panel. This system must receive the written approval of the Director of the P.A.'s Interstate Transportation Department or his authorized representative.

F. TELEPHONE SERVICE

An empty conduit will be installed from the Bus Terminal point of telephone distribution to the perimeter of the leasehold.

G. LIGHTING

The Port Authority may furnish and install the line of fixtures located in the public corridor and adjacent to the leasehold. The Tenant shall reimburse the Port Authority for all costs incurred.

ATTACHMENT F1 NEW YORK CITY MUNICIPAL FIRE ALARM AT LGA AND JFK

I. GENERAL

A fire alarm box shall be furnished and installed as shown on the Contract Drawings. The box shall be mounted on a pedestal.

II. COORDINATION WITH THE NEW YORK CITY FIRE DEPARTMENT (NYCFD)

A. The tenant's contractor shall contact the NYCFD, Bureau of Fire Communications, Queens Coordinator, located at 104 Duane Street, New York, New York, telephone (212) 374-8566, for information on materials to be obtained, their cost, and also to notify the Coordinator of the commencement of work.

1. The Coordinator will determine the cost and instruct the contractor where to forward the required certified check as advance payment for materials, as well as the procedure for obtaining the necessary materials from the Fire Department Storehouse located at 87 Union Street, Brooklyn, New York.

2. The pedestal, subbase, terminal box, and gasket are among the materials that shall be obtained by the contractor from the Fire Department Storehouse.

B. Installation of the fire alarm mechanism, as well as all "live" electrical connections, will be performed by the NYCFD.

III. RELEVANT DOCUMENTS

A. Pedestal Base Sketches SK-FA-1 and SK-FA-2, this Attachment.

B. NYCFD Signal Cable Specification:

City of New York Fire Department Fire Alarm Cable.

City of New York, Department of Purchase.

Cable Specification Number 12-C-9: 61T, Tentative Standard.

Fire alarm signal cable; polyethylene insulated, polyvinyl chloride jacketed.

IV. SUBMITTALS TO THE PORT AUTHORITY

In order for the P.A. to obtain New York City Fire Department approval of the proposed fire alarm installation, three (3) sets of the following information are required to be sent to the P.A., via the Tenant's Alteration Application:

A. A plot plan of the building showing the exact location of all the fire alarm boxes and their relationship to site conditions; i.e., roads, sidewalks, fences, islands, building exits, etc.

B. Details of the fire alarm box, pedestal, foundation, cable and duct installation, etc.

C. Specifications for fire alarm equipment, cable installation procedures, etc.

D. The above may be submitted in the form of contract drawings, sketches, and formal specifications, for proper transmittal by the P.A. to the New York City Fire Department.

V. INSTALLATION

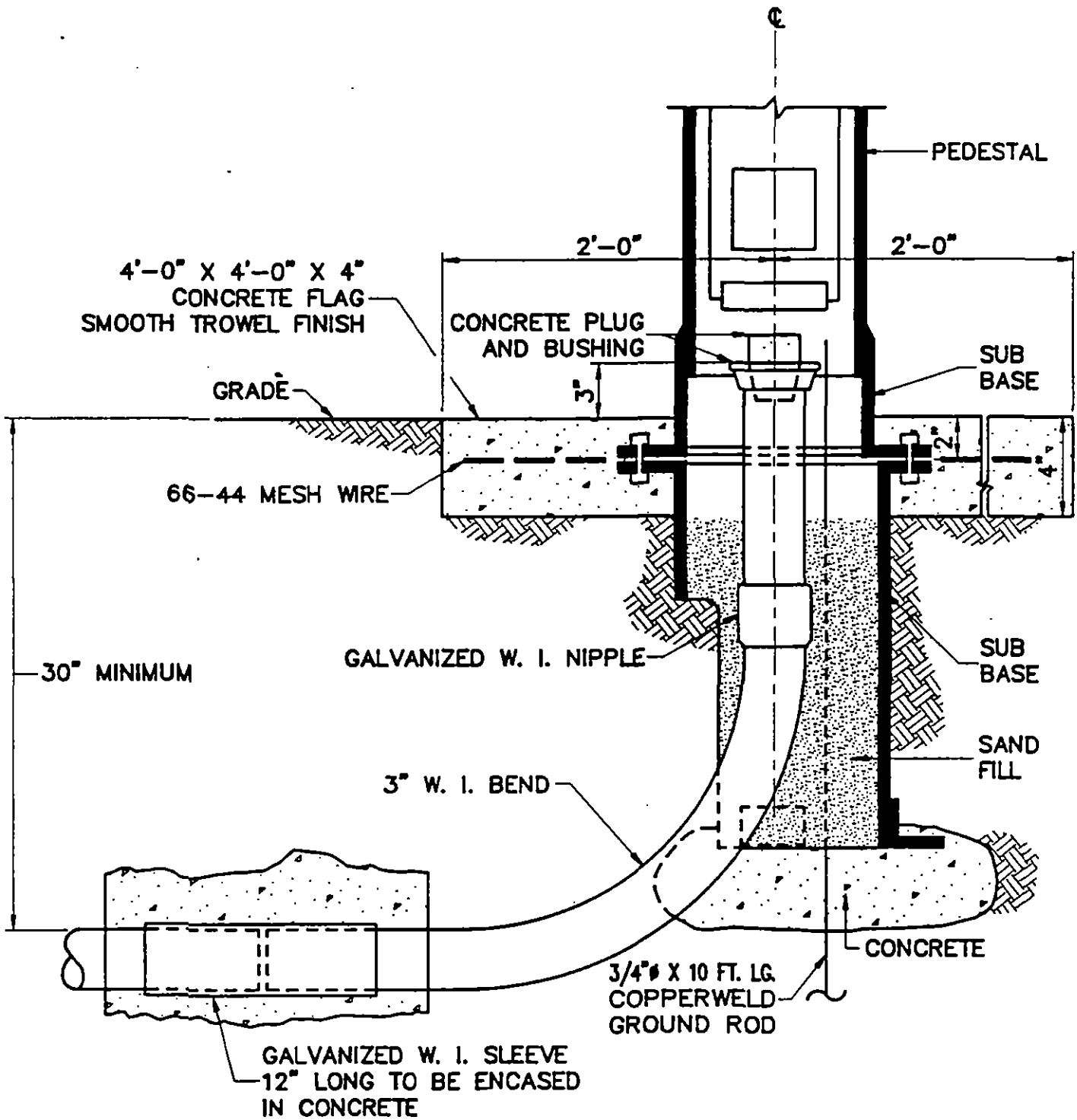
A. The Contractor shall notify the Queens Coordinator, NYCFD Bureau of Fire Communications, 48 hours prior to commencement of work on the fire alarm system.

B. The Contractor shall protect and maintain the existing fire alarm system and all workmanship. Equipment and materials used in connection with the New York City Fire Alarm System shall comply with the requirements of the NYCFD Bureau of Fire Communications.

C. A ground rod shall be installed in an approved manner and the ground connection thereto shall be accessible to inspection and test. Maximum resistance to ground at the ground rod shall be 25 ohms.

D. Code wheel designations for the New York City fire alarm boxes shall be obtained from the NYCFD.

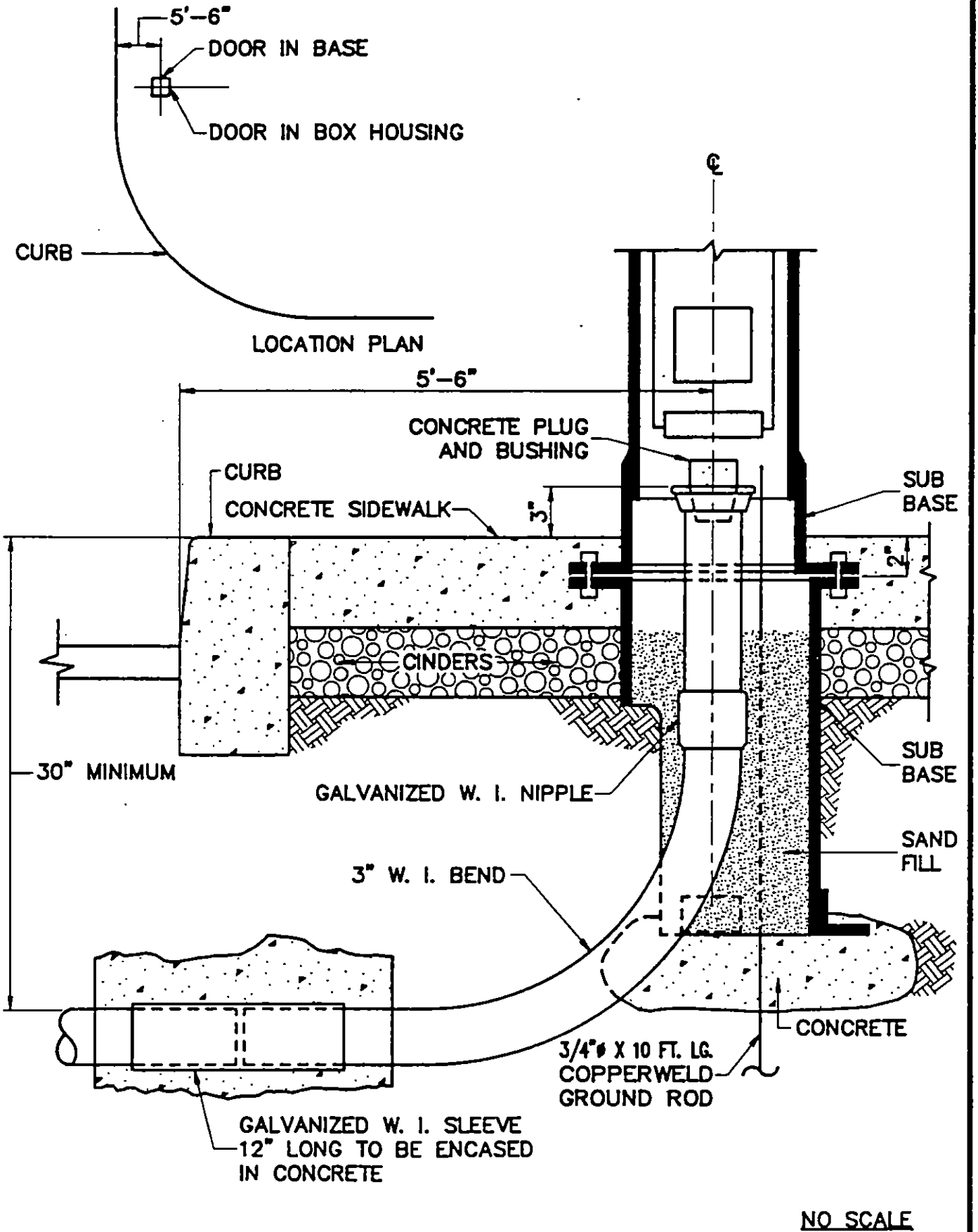
E. At John F. Kennedy International Airport, code wheel designations for the proprietary fire protection system shall be obtained from the Manager of Plant & Structures.



NO SCALE

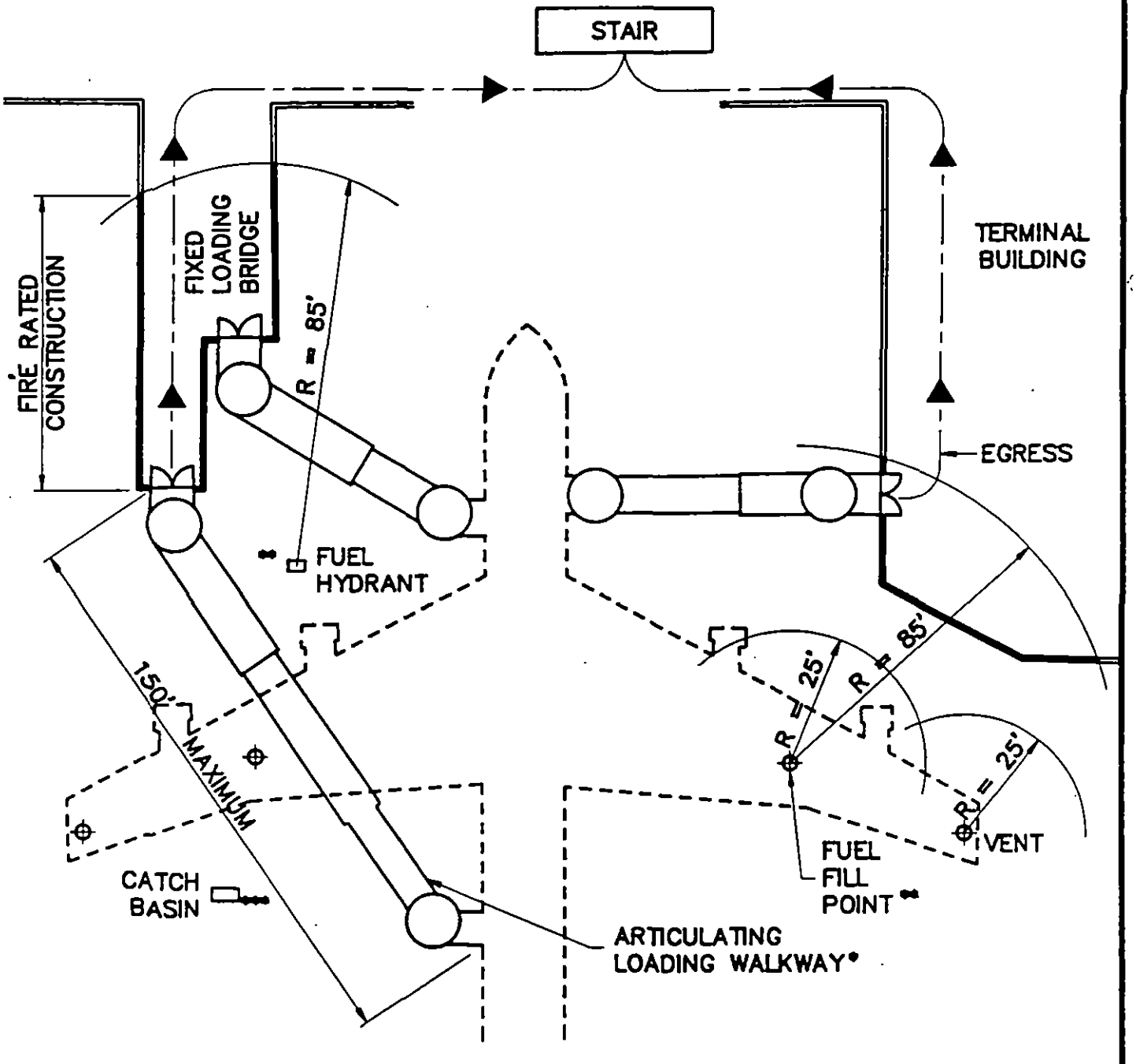
PEDESTAL BASE
FOR FIRE ALARM POST IN FLAG
(NEW YORK CITY FIRE DEPARTMENT)

SK-FA-1



PEDESTAL BASE
FOR FIRE ALARM POST IN SIDEWALK
(NEW YORK CITY FIRE DEPARTMENT)

SK-FA-2



NOTES:

* Loading Walkways – see Sections 6–IV–F and 13–IV–B of this Manual.

** For Clearance of points of potential fuel spillage see Section 13–IV–A of this Manual.

*** Catch basins – see Section 8–III–C of this Manual.

THE PORT AUTHORITY OF NEW YORK & NEW JERSEY

M E M O R A N D U M

To: W. Biancamano, R. Catlin, P. Ciano, E. Chalom, G. Doherty, E.K. Farrely, W. Fife, P. Galya, R. Goode, G. Jensen, J. Kau, J. Miller, M. Ronis, S. Smolenski, E. Takla, V. Volpicelli

From: Ennala Ramabhushanam

Date: October 23, 1990

Subject: TENANT CONSTRUCTION REVIEW MANUAL - AMENDMENT #1

Copy To: A. Brociner, P. Cooper, V. Dovletian, E. Fasullo, M. Poliacof, O. Suros, TCRU Staff

Listed below are the pages of the Tenant Construction Review Manual that are amended and must be replaced by the pages attached herewith. The changes are highlighted with an *.

Pages 6-2,
9-5, (re-enumeration of paragraphs)
9-6
10-6 (new page)
11-3, 11-5

Please insert this sheet in the front of the Manual.

Ennala Ramabhushanam

Ennala Ramabhushanam, P.E.
Manager
Quality Assurance Division

IV. PORT AUTHORITY DESIGN CRITERIA

A. All structures, including those in New York State, shall be designed for earthquake Zone 2 forces. BOCA provisions shall apply, unless more stringent local laws are adopted.

B. Roof Snow Load in New Jersey:

In calculating snow loads, BOCA "Ground Snow Load" shall be 25 psf.

C. Ceilings:

1. Cement plaster ceilings - see Attachment S1.

2. Lightweight ceilings in New Jersey - see Attachment S2.

3. Lightweight ceilings in WTC - see Attachment S3.

* 4. For the suspension of lightweight ceilings to resist earthquake forces see ASTM E580.

D. Vehicular Traffic (Airports):

1. Elevated roadways shall be designed for seismic forces according to the "Guide Specifications for the Seismic Design of Highway Bridges" by AASHTO, or the relevant State DOT standards for earthquakes, whichever is stricter.

2. The minimum loading for departure and arrival ramps servicing passenger terminals shall be HS 15-44. Use AASHTO design. All other ramps servicing cargo facilities or road overpasses: AASHTO design using HS20 minimum loading.

E. Highway Signs and Luminaries:

Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals; American Association of State Highway and Transportation Officials (AASHTO).

F. Loading Bridges (Airports):

1.	Minimum Live Loads:	Floor (LL) - 40 psf or a concentrated load of 300 lbs. Roof (RLL) - as per local code.
2.	Minimum Wind loading (WL):	12.5 psf lateral for the extended (operational) mode (combined windward and leeward pressure). 25 psf lateral for the retracted (stowed) mode (combined windward and leeward pressure).

V. DETAILS OF ELECTRICAL REVIEW

The following are representative of details reviewed:

1. The review shall extend to existing code violations in areas affected by the work.

2. The power distribution system (feeders, switchgear, transformers, panels and overcurrent protective devices), including coordination of plans regarding connections and available capacities with P.A. utilities. A one-line diagram giving source identification, conductor types and sizes, connected and demand loads, basis of source capacity, voltage drop, and adequacy of overcurrent protection shall be presented. Characteristics of special loads, e.g. large motor loads, shall be detailed.

3. Obstruction, envelopment or elimination of electrical ducts, vaults, manholes, and handholes, by new construction.

4. All materials and apparatus shall have been tested and approved for the proposed use by the agency or testing laboratory recognized in the relevant jurisdiction. See Section 14 of this Manual.

5. Coordination with other trades such as:

   a. Architectural: Place of assembly lighting.

   b. Structural: Suspension of lighting fixtures.

   c. Mechanical: Ventilation and cooling of electric rooms.

6. Wiring methods (conductors and raceways).

7. Grounding, including system grounding of derived systems such as transformers and generators.

8. Communications wiring with regard to radiation, electromagnetic interference, electrical safety and fire hazards.

9. Signal wiring and emergency power for fire alarm and detection systems.

10. Emergency power for lighting, exit lights and signs and opening protectives.

11. Computer room disconnecting means for electronic and HVAC equipment.

12. Code limitations on plastic light diffusers.

13. Metering installation, with regard to applicable PANY/NJ or utility standards.

14. Alarm, detection and sounding devices. See Section 12 of this Manual.

15. Physical safety, such as clearances around equipment, and exit provision from within electric rooms.

16. Telephone installation shall not have any components in common with the power or lighting installation.

17 The coordination of fire detection and fire suppression provisions with designs for open wiring such as in computer rooms and raised floors. For guidance, see the New York City Electrical Code, Bulletin Number 126, revised 1983, and NEC Article 645.

18. Transformers and capacitors that are PCB-contaminated or PCB-filled shall be identified.

    Any operation that can possibly cause PCB to spill, including repairs, must be coordinated with the Facility Manager.

    The Tenants shall provide the Facility Manager with assurance that they have complied with the requirements of:

    a. Toxic Substances Control Act (Federal).

    b. Regulations of federal, state and local environmental protection agencies.

*19. The support of all equipment shall comply with the provisions of the Structural Section of this Manual, including the seismic forces.

*8. The support of all equipment shall comply with the provisions of the Structural Section of this Manual, including the seismic forces.

V. DETAILS OF PLUMBING REVIEW

The following are representative of details reviewed:

1. Drawings shall show a complete layout and riser diagrams.

2. An adequate extent of existing conditions and systems shall be shown to enable the review of alterations.

3. Specifications for materials, equipment, fixtures, insulation, installation procedures, etc., shall be submitted.

4. The review shall extend to existing code violations in areas affected by the work.

5. Areas of work shall be clearly identified with column numbers and occupancy identification.

*6. The support of all equipment shall comply with the provisions of the Structural Section of this Manual, including the seismic forces.

7. The following is a partial list of items to be shown in the design documents (drawings, specifications, etc.):

   a. Domestic Cold & Hot Water

      Water service size; connection.
      Gooseneck at street main.
      Curb box and valve.
      Pressure reduction valve.
      Approved meter; hook-up and setting.
      Water conserving devices.
      Fixture roughing, trim, flow controls.
      Expansion joints; accessibility.
      Hot water heater hook-up; PRV & TRV.
      Hot water circulation.
      Plugged outlets; accessibility.
      Backflow protection: airgaps, vacuum breakers, backflow preventers; accessibility.
      U.S. Public Health Service Requirements.
      Triturator room water requirements.
      Plastic materials.
      Piping materials: pipe, joints, lining, etc.
      Insulation, fire rated; Energy Code compliance.
      Testing.
      Hose Bibbs; flushing hydrants.
      Facilities for the handicapped.

   b. Fire Standpipe

      Size of water service.
      Separate or combined system where permitted.

Curb valve and box.
Meter (if required).
Number of siamese and accessibility.
Size of siamese risers, cross connection.
Pressure reducing valves.
Yard hydrants.
Roof manifolds, valves and ball drip.
Freeze Protection.
Hose stations, hose lengths for full coverage.
Hose size; check building occupancy and classification.
Ladders for high valves.
Riser control valves; supervised or chain-latched.
Check valves and automatic ball drips.
Riser diagram.
Signs at siamese and hose stations.
Pipe, fitting, materials, joints, etc.
Fire line valves.
Supports.
Hazardous area protection.
Pressure and flow tests.

c. Gas

Work by Utility Company.
Type of service (L.P., M.P.).
Outside cut-off valve.
Service sleeve location; sealing.
Gas meter location and piping; distance to last outlet.
Piping sizing with riser diagram.
Gas regulator and vent, if required.
Underground pipe "Mill Wrapping," ground cover.
Gas piping, fitting materials, joints.
Hazardous area protection; automatic shutoffs.
Pressure to operate equipment.
Tests.

d. Sanitary

Building sever size; directional flow connection.
Building trap and pit.
Fresh air inlet.
One full size stack.
Grease traps; hook-up, flow control.
Building sanitary drain location and sizing.
Cleanouts uncovered.
Expansion joints; accessibility.
Back water valves.
Ejector piping hook-up, venting, valves.
Types of Joints.
Fixture requirements-Code elongated, open front, etc.
Facilities for the handicapped.
Test requirements.

e. Storm Drainage

Building sewer size; directional flow connection to sewer.
Building drain size, slope, Code roof areas.
Leader size; Code roof areas.
Cleanouts; uncovered.
Expansion joints; accessibility.
Test requirements.

f. Oil Separator

Overall separator size, capacity.
F.A. inlet.
Relief vent and height.
One full size stack.
Overflow line, waste oil tank, vents.
Cleanouts; accessibility.

g. Gasoline and Motor Diesel Oil

Licensed Installer.
Size, location, capacity, construction of tanks.
Burial depth; earth cover; concrete cover.
Distance from basements, pits.
Corrosion protection.
Size, height of vents.
Tank encasement.
Fill box location, identification.
Pipe, fittings, joints.
Piping arrangement for suction connection.
Double swing joint connections.
Tank supports, foundations, anchorage.
Sewer protection; oil separator.
Testing.
Abandoning of tanks.